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ABSTRACT

The objective of this "Preparing for Tomorrow's World" (PTW) program module is to help students (grades 7-8) gain insight into coastal issues and confront moral dilemmas which relate to those issues. PTW is an interdisciplinary, future-oriented program incorporating information from the sciences/social sciences and addressing societal concerns which interface science/technology/society. The program promotes responsible citizenry with increased abilities in critical thinking, problem-solving, social/ethical reasoning, and decision-making. The module is comprised of two parts: estuary marshes and activities along the coast. Each is introduced by a filmstrip and followed by student activities--written exercises, role-play simulations, and dilemma discussions (available in the guide as student handouts). Dilemmas, brief stories in which two or more moral/ethical conflicts must be resolved, are accompanied by questions to stimulate thinking and/or generate discussions. In addition to student handouts and instructional strategies, the teaching guide contains module overview, chart indicating moral issues (as identified by Kohlberg) in each dilemma, suggested time schedule, bibliography, and sources for supplementary materials. The module may be used as a separate unit of study, as a mini-course, or incorporated into existing curricula where appropriate. (JN)

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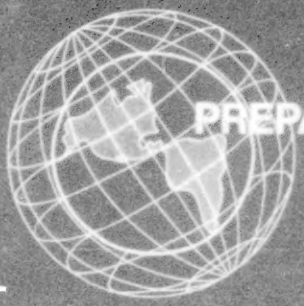

PREPARING FOR TOMORROW'S WORLD

COASTAL DECISIONS:
Difficult Choices

Teacher's Guide

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Preparing for Tomorrow's World
An Interdisciplinary Curriculum Program

Coastal Decisions: Difficult Choices
Energy: Decisions for Today and Tomorrow
Future Scenarios in Communications
Space Encounters
Technology and Changing Life-Styles
Perspectives on Transportation
People and Environmental Changes
Environmental Dilemmas: Critical Decisions For Society
Of Animals, Nature and Humans
Beacon City: An Urban Land-Use Simulation
Dilemmas in Bioethics
Technology and Society: A Futuristic Perspective

PREPARING FOR TOMMOROW'S WORLD

Coastal Decisions: Difficult Choices

Teacher's Guide

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PREFACE

TO THE TEACHER:

We live in an exciting, rapidly changing, and challenging world—a world highly dependent upon science and technology. Our world is changing so rapidly that we sometimes fail to recognize that much of what we today take for granted as common, everyday occurrences existed only in the imaginations of people just a few short years ago. Advances in science and technology have brought many dreams to fruition. Long before today's school children become senior citizens, much of today's "science fiction" will, in fact, become reality. Recall just a few accomplishments which not long ago were viewed as idle dreams:

- *New biomedical advances have made it possible to replace defective hearts, kidneys and other organs.*
- *The first aire flight at Kitty Hawk lasted only a few seconds. Now, a little over half a century later space ships travel thousands of miles an hour to explore distant planets.*
- *Nuclear technology—of interest a few short years ago because of its destructive potential—could provide humankind with almost limitless supplies of energy for peace-time needs.*
- *Computer technology has made it possible to solve in seconds problems which only a decade ago would require many human lifetimes.*
- *Science and technology have brought us to the brink of controlling weather, earthquakes and other natural phenomena.*

Moreover, the changes which we have been experiencing and to which we have become accustomed are occurring at an increasingly rapid rate. Changes, most futurists forecast, will continue and, in fact, even accelerate as we move into the 21st Century and beyond. But, as Barry Commoner has stated, "There is no such thing as a free lunch." These great advances will not be achieved with a high price. We are now beginning to experience the adverse effects of our great achievements:

- *The world's natural resources are being rapidly depleted.*
- *Our planet's water and air are no longer pure and clean.*
- *Thousands of plant and animal species are threatened with extinction.*
- *Nearly half the world's population suffers from malnutrition.*

While science and technology have given us tremendous power, we are also confronted with an awesome responsibility: to use the power and ability wisely, to make equitable decision tradeoffs, and to make valid and just choices when there is no absolute "right" alternative. Whether we have used our new powers wisely is highly questionable.

Today's youth will soon become society's decision-makers. Will they be capable of improving upon the decision-making of the past? Will they possess the skills and abilities to make effective, equitable, long-range decisions to create a better world?

It is our belief that the *Preparing for Tomorrow's World* program—will help you the teacher prepare the future decision-maker to deal effectively with issues and challenges at the interfaces of science/technology/society. It is our belief that the contents and activities in this program will begin to prepare today's youth to live life to the fullest, in balance with Earth's resources and environmental limits, and to meet the challenges of tomorrow's world.

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SECTION ONE:
Overview And Teaching Strategies

INTRODUCTION

A population density map prominently highlights the fact that our coastal regions are among the most populous areas. Over half the U.S. population resides along the coast. This is attestation to the multiple resources we derive from the coastal zone — from transportation, minerals, oil, food and wa er to beaches, aesthetics and recreation. Although we may live several or hundreds of miles from the shore, all of us are touched in some way or another by coastal activities. With increasing population pressures and energy needs, conflicts arising from the variety of demands exerted on the coastal zone have intensified to serious proportions.

In the recent era of industrialization, economic expansion, population growth and urbanization, we blatantly exploited the coast with impunity to sustain our many activities. Marshland became our garbage dumps and the ocean our mammoth sewage receptacle. The delicate sand dunes were transformed into vast tracts of housing or resort developments and became targets for erosion and storm damage. Rivers and channels were diverted or changed to accommodate shipping traffic. Piers, docks and warehouse areas, once they out-lived their usefulness, became abandoned, rotting relics.

Conflicts in the coastal region exist on several levels. At the level of human activities we find increased competition for the limited space. A parcel of land may be simultaneously desirable for refineries or a beach resort. Building developments may obliterate shellfish beds or fish spawning grounds upon which many depend for their livelihood. Disposal of the waste we generate has contaminated waters and frequently forced closing of beaches. Thus, a decision to use the area in one way conflicts with or precludes other activities. It is not always possible to satisfy all of our needs and desires simultaneously and moreover, we all have differing concerns and may not be in agreement as to our priorities. These discordances involve the underlying question of value preferences.

Another level of conflict which we have only begun to recognize and address is the clash between human activities and natural environmental processes. The natural environment functions within a system of intricate interacting balances and controls. The delicate nature of these balances, perhaps, appears more sensitive along the coastal area because the resultant effects are felt over a greater expanse. Although nature has remarkable regenerative powers, we often tax its limits to such an extent that recovery is all but impossible, save for our non-interference in the next several thousand years.

For example, large portions of the marshland are used as garbage landfill, because we have viewed these areas as worthless land. In doing so, we have taken out of production one of the most highly productive land areas. Marsh vegetation provide food and shelter for both land and aquatic animals. As marsh nutrients and spawning grounds diminish, ocean fish populations decline. Bird and shellfish communities are also affected, for marshes are important stopovers for migratory birds and serve as home for many shellfish. Often waste materials in the landfills contain highly toxic chemicals, and as water seeps through, these chemicals leach out, poisoning surrounding water and soil. Communities further inland are affected by flooding and more severe storm damage when marshlands no longer serve as a buffer against storm winds and water. Because of the many interdependencies in the marsh ecological system, the disturbances have broad ramifications. These dislocations are beginning to unveil as our activities make greater encroachments. But when fully exposed, the effects are often severe and produce problems of major magnitude.

Even an activity seemingly as innocuous as running supply boats to service an offshore drilling operation can cause disruptions in the natural environment and frequently emerge as economic conflicts with other interests. Channels may need to be dredged to allow for boat access. Dredging can damage or destroy aquatic organisms and change the water quality by stirring up the bottom sediment. The boats can introduce oil and chemical pollutants into the water, again affecting marine life. Fishing in the area can suffer significantly. Wakes from the boats can alter wave action and therefore effect the condition of the natural shoreline. Attempts to prevent sand loss from beaches are extremely costly propositions, even if successful.

In this module, *Coastal Decisions: Difficult Choices,* the unique and valuable resources of the coastal zone are highlighted, with particular reference made to our frequent folly in the use and management of this special resource. More recently, public interest and concern has led to major legislation designed to protect the coastal environment. Yet, conflicts over use of the coast will not abate, for old issues will come to the foreground and new issues will arise. These issues impact on economic, political and social systems as well as on the environment. Wise problem solving and decision making on these issues must take into account the scientific and technological aspects as well as the moral and ethical aspects. When dealing with a finite, limited and fragile resource such as the coastal zone, we must wrestle with the question of what is fair and right.

Many of these questions and decisions will be answered by our future citizens. It is hoped that this brief introduction to coastal resources conveyed in the student materials will generate an awareness as well as an understanding of our dependency and the need to protect and preserve the many benefits we derive from our coastal zone.

Overview of Coastal Decisions: Difficult Choices

Purpose

The purpose of this module is to help develop in students an understanding that the coastal area is an unique and important natural resource facing increasing pressures of development and consumption. Protection and preservation of this resource becomes an urgent and important priority for people and the ecosystem. Effective use and management of this resource also requires that our students, the decision makers of the future, recognize the basic issues and conflicting demands placed on the use and development of coastal resources. Through examination and analysis of the issues and associated conflicts, it is hoped that a greater understanding and appreciation of the dynamic interactions of the coastal environment will evolve.

Strategy

It is our belief that understanding the problems and issues and assuming responsibility necessitates knowledge and a sense of personal involvement. The knowledge base of this module is conveyed through two sound filmstrips and related student activities. While the background information is not detailed with facts, it is hoped that discussion of the concepts presented will draw upon and integrate what students know, information from the ongoing course of study and other types of experiences. The materials are thus intended to present problem situations, point out some critical elements, and stimulate discussion on the issues.

The issues which we have selected by no means cover the full spectrum of ongoing debates and concerns. What we have focused upon, hopefully, will illustrate a variety of activities that take place along the shoreline and the ensuing conflicts which arise. It is all important for the students to recognize that ethical/moral implications are an integral part of the decisions made. These are highlighted in the dilemma stories, the discussion of which will represent a significant portion of the classroom activities.

In order for students to adequately discuss an issue, information or a frame of reference is essential. They must also be able to gather, organize and select information to develop an argument. Activities have been designed to assist the students in exercising some of these skills. The role taking activities provide the opportunity to examine alternative perspectives or perspectives different from one's own in order to expand the student's level of consciousness.

The activities emphasize to a large extent student to student interaction, for we believe that a dynamic interchange of ideas will enhance students' involvement in the subject matter and provide a challenge to explore other ideas. Students' intellectual growth can be promoted when they are given the opportunity to critically examine their own ideas and ideas of others in an active manner rather than simply acquiring information passively.

Role play and discussion of dilemma situations are employed as a major strategy to lead students to actively deliberate questions and issues. The dilemma situations are adapted from actual case histories while others, although hypothetical, reflect critical choices that are being considered today or will need resolution in the near future. They are heightened, often artificially, in order that the issues are clearly pitted, one against the other, and thus students can gain a sense of personal involvement or urgency.

In discussion or role playing where students have to take a position and defend it, value or ethical conflicts will be experienced. Ideas and opinions of others may come into conflict with their own, but in the course of evaluating alternatives, they will begin to examine and consider the implications and consequences of their own position on the argument. Also, the level of relevancy becomes elevated when students hear arguments from their peers rather than from adult authority or the printed word. Although the discussion process may seem to move more slowly than imparting information through lecture or reading, it places a demand on students to organize, coordinate and interrelate information and concepts. In this manner, they may begin to understand the dynamic interrelationships of coastal issues and problems and the difficulty of decision making in this area.

Structure of the Dilemmas

The dilemmas are essentially brief stories that pose a critical decision to be made by the central character(s). They are heightened in such a way as to stimulate students to express their opinions and partake in the dialogue. The basic format developed by Kohlberg is extended to include additional background information surrounding the dilemma and special focus on one or more issues identified in the readings. The choice to be made revolves around the moral/ethical issues of the situation, and it is the moral/ethical implication that provides the thrust for the discussion.

Although the dilemmas involve individuals, we have constructed the different dilemmas to reflect decisions having effects at the personal, community, national and international levels. Hence, students can begin to expand their scope and consider impacts from a variety of perspectives. However, in view of Piaget's model of intellectual development that places seventh and eighth grade students at the stage of transition from concrete operational thinkers to formal logical thinkers, several dilemmas in this module are directed at the more personal level of social interaction. This is intended to bring coastal issues into closer proximity with the students' own lives and concerns, and in a sense make problematic situations more "real" from their perspectives.

The dilemmas as presented are simple in form but can be further developed by the teacher with increasing complexity, depending on the intellectual and conceptual level of students as well as their interest and curiosity. The subject area or course in which this module is taught will determine ways in which many of

the concepts might be further developed — such as concepts from sociology, economists, ecology, government, philosophy, history, etc. Drawing relationships from what is learned in the course will inevitably make students' learning more meaningful.

Each of the coastal dilemma stories presented in this module concentrates on two or more basic values issues. Table 4 identifies the issues emphasized in each of the dilemmas.

Table 4

Issues Contained in Each Dilemma

Dilemma	Issues*								
	punishment/blame	property	affiliation role	law	life	truth	governance	civil rights/ social justice	morality/ mores
Dilemma 1: The Outdoor Classroom		X				X	X		
Dilemma 2: Water for Pottstown		X						X	
Dilemma 3: Crabbers and Shrimpers				X				X	
Dilemma 4: On the Beach		X		X				X	
Dilemma 5: Home on the Beach		X		X				X	
Dilemma 6: Oystertown and Oil						X	X		

* These basic moral issues as identified by Kohlberg comprise the underlying elements of a conflict situation involving a moral decision. Our dilemmas were constructed to incorporate two or more of these issues. Dilemma resolution requires a choice or action to be made between conflicting issues. For instance, in a dilemma dealing with the issue of governance and social justice, the questions surrounding the issue of governance include: 1) Should one accept or reject the authority of the governing body? 2) What are the characteristics and responsibilities of good government? The social justice issue raises the questions: 1) Should one defend or violate the political, social and economic rights of another person? 2) What are the bases of these rights?

Coastal Decisions: Difficult Choices in the School Curriculum

This module, designed for the middle school grades (7-8), may be used in a number of subject areas: social studies, science, language arts, etc. In social studies classes questions of government responsibilities and regulations, public participation in coastal zone decisions, or private interests vs. public interests, might be explored in greater depth. In science classes emphasis might be placed on ecological concepts and human effects on the coastal environment. Analysis of argument, persuasive techniques or public speaking might be the focus of English classes.

The dilemmas can also serve as a "springboard" for teachers to develop additional dilemmas for their classes. So often it is the case that many of the best dilemmas are developed spontaneously from the materials that are part of the ongoing coursework. Having used these dilemmas, teachers can better understand the intent and value of dilemma discussions and begin to recognize other problematic situations that confront society. The question of relevancy and meaning can be bridged when specific information is related to its impact on our lives and the more global effects on the future of human society.

All important in these materials and the dilemma discussions is to engage the students in the consideration of coastal issues as representative of problems involving people and the environment. While the environment serves as our basis of support and pleasure, it has an existence of its own. To harmoniously coordinate the two notions will require new perspectives and insights which educators can nurture in the classroom.

Objectives of Module

- To increase student knowledge of coastal issues.
- To increase student awareness that coastal issues are intimately related to social, economic and political issues and activities.
- To help students recognize the importance and unique nature of the coastal environment.
- To increase student skills in the analysis of issues related to coastal decision making.
- To expand students' perspectives on issues by the consideration of alternative solutions/viewpoints and the implications and consequences of different decisions.
- To enable students to more effectively use and integrate information.
- To increase students' ability to develop and present arguments in a logical, comprehensive manner.
- To increase the moral/ethical reasoning ability of students.
- To provide opportunities for students to more critically examine their value system.
- To increase student self-esteem and ability to communicate more effectively in classroom discussion.

Components of Coastal Decisions: Difficult Choices

- Teacher's Guide
- 2 filmstrips and cassette tape recordings
- 16 student handouts
- 3 overhead transparencies
- 1 picture pack (5 photographs)

Coastal Decisions: Difficult Choices is comprised of two parts, each introduced by a filmstrip, followed by student activities and dilemma discussions. While the activities and dilemmas may be used selectively, it is recommended that the order of activities be adhered to since the information in some cases is sequentially derived from preceding activities. The module is designed for flexibility and therefore can be used to supplement ongoing classroom activity/study. It is not necessary to conduct this module over an uninterrupted block of time.

The materials form the following structure for classroom activity:

I Showing of filmstrip
II Review of information on filmstrip
III Student activities
- written exercise, surveys, etc.
- role play situations
- dilemma discussions

Again, the dual purpose of this module is to gain insight into coastal issues and confront moral dilemmas which relate to those issues.

Suggested Time Schedule

Class meeting:

1	Activity 1:	View Filmstrip I - Estuary Marshes Discussion of Filmstrip I
2	Activity 2:	Features of a Coastline Transparency #1, #2
	Activity 3:	Wetland Values Student Handout #1, #2
3	Activity 4:	What Are Your Plans for This Land?
4		Picture Pack containing 5 photographs
5	Activity 5:	Discussion of Dilemma 1, *The Outdoor Classroom* Student Handout #4
6	Activity 6:	Discussion of Dilemma 2, *Water for Pottstown* Student Handout #5
7	Activity 7:	View Filmstrip II - Coastal Activities
	Activity 8:	Discussion of Filmstrip II Student Handout #6
8	Activity 9:	Discussion of Dilemma 3, *Crabbers and Shrimpers* *Student Handout #7*
9	Activity 10:	A Beach Survey Student Handout #8
10	Tabulate and discuss survey results Student Handout #9 Transparency #3	
11	Activity 11:	Discussion of Dilemma 4, *On the Beach* Student Handout #10
12	Activity 12:	Committee Meetings to Discuss Dilemma 5, *Home on the Beach* Student Handouts #11, #12, #13, #14
13	Committee Presentations to the Town Council and Council Vote	
14	Activity 13:	Discussion of Dilemma 6, *Oystertown and Oil* Student Handout #15
15	Activity 14:	Oil and Coastal Changes. Scenario Writing Student Handout #16
16	Presentation of Scenario	

SECTION TWO:
Activities And Teaching Notes

I. ESTUARY MARSHES

In this section students are introduced to some of the ecological concepts governing interactions in the wetlands area. The important benefits that people derive from the wetlands are repeatedly emphasized because previous misconceptions of marshes as useless swamps have led to serious consequences, the impacts of which we are presently experiencing – polluted waters, flooding, declining fish population, loss of plants and animal species, etc.

Activity 1: Showing of Filmstrip I: Estuary Marshes

Materials

- Filmstrip I: *Estuary Marshes*
- Cassette Tape I: *Estuary Marshes*

Overview

The filmstrip is intended to provide students with an understanding of the dynamic interrelations of estuary marshes. The many diverse types of benefits offered by marshlands are highlighted. Some of these benefits are ones that we do not normally associate with marshes.

Comments and Suggestions

Since the purpose of the filmstrip is to cover a broad overview, the several concepts presented are not treated with great depth or detail. You may wish students to do additional research on the topics or further expand the concepts in class discussion. Also, students may need additional scientific information in order to more fully understand and appreciate the concepts.

Estuary Marshes: Picture Frames and Script

1 COASTAL DECISIONS: Difficult Choices

2 AFFILIATION

3 TITLE PAGE: Estuary Marshes

4 PHOTOGRAPH CREDITS

5 SUNSET OVER BAY AND WETLANDS
One of the most important and productive areas of the natural world is the estuarine zone — the area between the land and the sea.

6 AERIAL VIEW OF ESTUARY
This is where the fresh water rivers mix with the salt water of the seas.

7 BAY AND HARBOR
An estuary is made up of bays, harbors,

8 CHANNEL AND INLETS
channels, inlets,

9 BARRIER BEACH ISLAND
barrier beaches,

10 MARSHLAND
and tidal marshes.

11 DUCKS FEEDING AMONG TALL MARSH GRASSES
Plant and animal life living here depend on one another for existence.

12 FAMILY OF DUCKS IN MARSHES
Some provide shelter, others provide food.

13 CLOSE UP OF MARSHES WITH BIRDS AND DUCKS
An estuary marsh provides protection from the forces of the sea. For this reason and its abundant food supply, it is a home for birds,

14 FINFISH
finfish and

15 MUSSELS AND MARSH GRASS
shellfish.

16 SCHOOL OF SMALL FISH
It is also a nursery for many fish who later spend their lives in the ocean waters.

17 A CATCH OF FISH
The fish that are born and grow up in marshlands or wetlands are often caught many miles from the estuarine zone.

18 FISH MARKET
Fishermen, therefore, depend on the marshes even though the fish they catch are found far out at sea.

19 CLOSE UP OF MARSH PLANTS
The wetlands are a valuable source of food for various types of animal life. Examples of wetland plants are marsh grasses, marine herbs, reeds and algae.

20 MARSH GRASSES AND GEESE
Some plants such as the marsh grasses are eaten directly by geese.

21 CLOSE UP OF SHELLFISH
Other animals eat fragments of plants which had died and decayed.

These fragments are part of the detritus which float in the water.

Detritus are remains of plant and animal life and serve as nutritious food for many types of fish and shellfish.

22 OCEAN WAVE ACTION
Tidal action washes or flushes the detritus into tidal creeks, bays and ocean waters twice each day.

Tidal action also flushes other organic and mineral nutrients into the waters that connect with the estuary.

23 OCEAN CATCH
Even fish that never enter or use wetlands are dependent on the estuarine zone. The action of the tides are continually transporting food from the marshes to the ocean.

24 SEAGULLS DIVING FOR FISH
This food is eaten by some animals, which in turn are eaten by others.

25 TABLE OF SEAFOOD
When we eat fish or shellfish we are in fact eating the marsh food, but indirectly.

Many forms of life are therefore dependent on wetlands vegetation.

26 FIGURE 1 — COMPARISON OF MARSH AND WHEATFIELD PRODUCTION
People do not usually think of marshes as an important food growing area. Yet, it is one of the most productive zones in the world. For example, one acre of wetland produces between 5 and 6 tons of dry plants. One acre of wheatfield produces only one-half ton of wheat.

The wetlands therefore provide abundantly without our having to plow, seed or fertilize.

27 INDUSTRIAL WATERFRONT WITH OUTFALL PIPES
The wetlands also assist in absorbing sewage and wastewater discharged into rivers upstream.

After partial treatment of the sewage to remove most solid materials, the wastewaters are discharged into the rivers.

28 RIVER FLOWING THROUGH MARSHES
The rivers carry wastewaters into the wetlands. Here the waste materials are converted by marsh organisms and recycled. Water passing through the marshes is thus cleansed, and pollution in waters downstream is reduced.

29 SEWAGE TREATMENT PLANT
Wastewater and sewage treatment plants are very costly to build and operate.

Wetlands can serve as a tertiary or final sewage treatment system, free of charge.

30 POLLUTED RIVER
However, if large amounts of polluted materials are discharged into the wetlands, the oxygen in the water and the purity of the water are greatly reduced. The natural treatment system will not work, and waters remain polluted.

Polluted water is not suitable for fishing, swimming, and other recreational activities.

31 DIRTY WATERFRONT AREA
The natural system will work for us and save us money if we don't overload it.

32 FIGURE 2 — COMPARISON OF WASTE TREATMENT COST
Recent studies have found that 19 lbs. of sewage per day can be treated or removed by an acre of marshland.

The value of this tertiary treatment is estimated to be about $14,000 per year. In other words, this is what it would cost people to mechanically and chemically treat the waste, if the *acre* of marshland were not available.

33 COASTAL STORM SCENE
In times of storms the estuary marsh has another role. It absorbs a portion of wind and storm energies, and stores large quantities of flood and storm waters. If it were not for the wetlands many upland properties might be destroyed or damaged.

34 LAND FILL DEVELOPMENT
Many wetland areas have been filled and developed for housing, factories or shipping docks.

35 A DENSELY DEVELOPED BEACH FRONT
Once filled, the wetlands loses much of its ability to absorb flood waters. Moreover, developments close to the sea now have little protection from wind and water.

36 ERODED BEACH AFTER A STORM
Wetlands never remain the same. Because of storms and winds, vegetation can be destroyed and land eroded. However, with time the wetlands adjust to these physical changes.

37 STORM DAMAGED HOUSING
Man-made structures on the other hand do not adapt. There is no guarantee they can be completely safe from the forces of nature.

38 BEACH SCENE
The estuarine zone is also valuable for recreational activities, such as bathing.

39 SAIL BOATS
sailing,

40 WATER SKIER
water skiing,

41 TOURISTS EXPLORING COASTAL CLIFFS
sightseeing,

42 FISHING
clamming and surf fishing.

43 OVERVIEW OF ESTUARINE ZONE
The estuarine zone is important in many ways and serves us generously.

44 SUNSET (Same As Slide 1)
However, it is a delicate area and can be easily damaged if not treated with care.

Discussion of Filmstrip I: Estuary Marshes

After viewing the filmstrip, the questions which follow may be useful in discussing the facts and concepts presented.

- What are some of the features found in an estuarine zone?
- What is an ecosystem? Describe an example of an ecosystem.
- What types of living things might one find in the marshes or wetlands? Plants? Animals?
- In what ways are the wetlands important to people?
- How might ocean fish depend on the wetlands?
- In what ways have people misused the wetlands?
- What is detritus? What is its importance?
- What is a food chain? Give an example of a coastal food chain.
- What are some of the reasons why wetlands should not be filled in and built upon?

Activity 2: Features of a Coastline — a Mapping Exercise

Materials

Overhead transparencies — Features of a Coastline
1 — Map outlining a coastline
2 — Overlay identifying the features

Overview

This exercise is intended to orient students to the physical features of the coastline as illustrated on a map and to reinforce some of the terms commonly used. Standard cartography symbols are employed and the ones employed here should add to the students' repertoire and enhance their map-reading skills.

Procedure

Students should have an understanding of the following terms before attempting to locate them on the blank map:

barrier beach — a low land form composed of sand and loose sediment transported by waves, currents and winds. Barrier island, barrier spits and bay barriers are the different types of barrier beaches and enclose lagoons and estuaries. (The barrier beach shown on the transparency is a spit, because it is attached to the mainland.) Barrier beaches serve the important function of protecting lagoons and salt marshes which serve as nursery grounds for numerous marine animals.

bay — a wide inlet of water indenting the shoreline and forming a protected area along the shore of a sea or lake; usually smaller than a gulf.

channel — a deeper part of a harbor, river or strait; some are created by dredging to accommodate shipping traffic into ports.

harbor — a protected body of water, deep enough to provide anchorage or port facilities.

inlet — a narrow passage of water between peninsulas or through barrier beaches, leading to a bay or lagoon.

lagoon — a wide, shallow bay protected from oceanic forces by a barrier beach. The brackish waters of a lagoon are mixtures of fresh water from the emptying rivers and salt water from the sea.

tidal march — broad lowlands fringing bays and lagoons regularly flooded by the tidal cycle; a highly productive area abundant with grasses, algae and numerous animal species.

Using transparency #1, have the students identify the features listed above. Their responses can then be compared when transparency #2 is overlayed.

Comments and suggestions

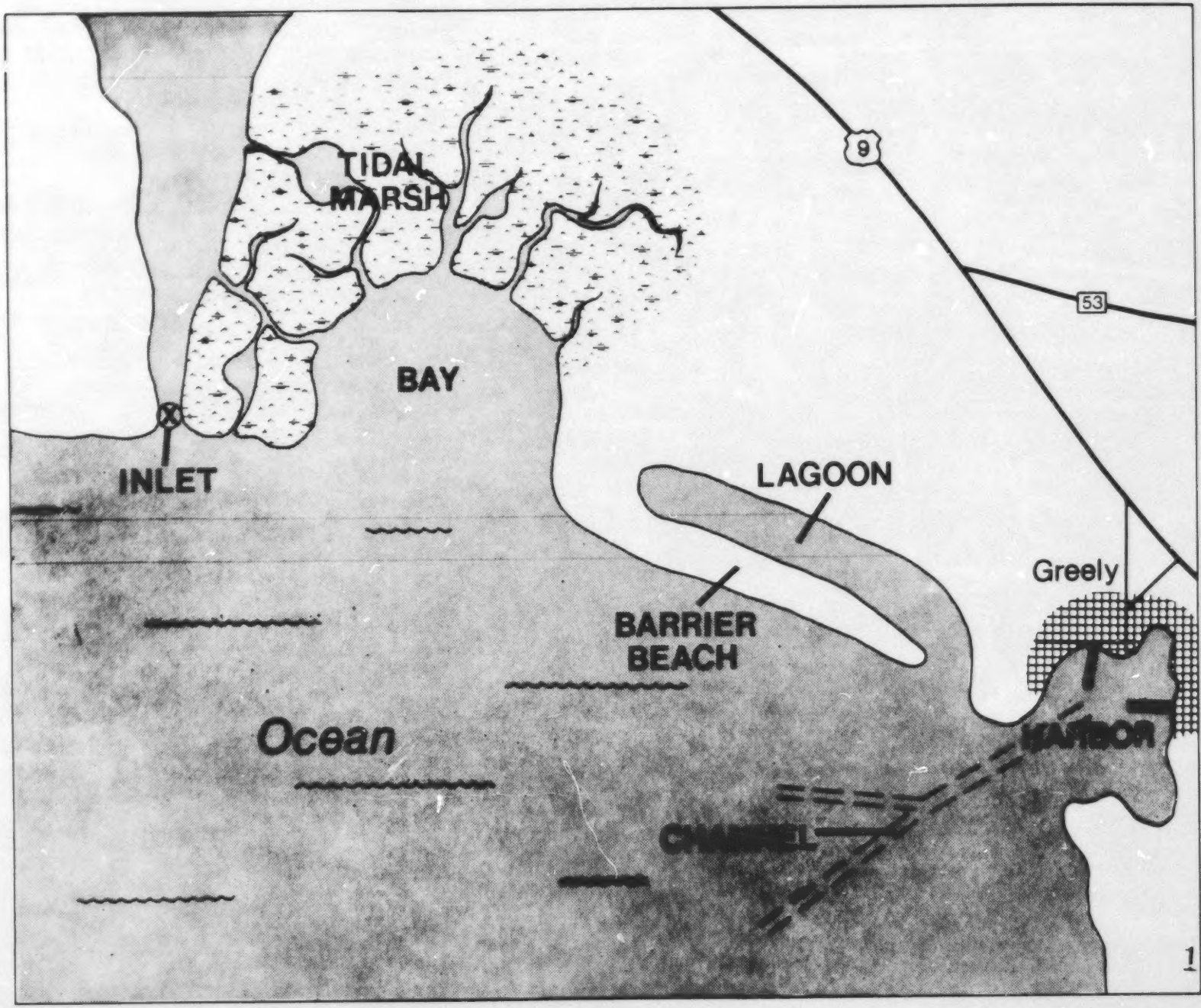
It may be useful to have the students share some of their experiences at the shore and describe some of the observations. These will help them to relate the concrete to the symbolic representation depicted on maps.

As an extension exercise students may find it interesting to locate these areas on a map of a coastal state. Many maps indicate special land features such as marshlands, forests, wildlife preserves, piers and docks, etc. Such maps, in addition to providing information about inter-connecting road systems and location of towns, can offer valuable insight into the character of the state.

For example, consider the following quesitons:

- Are the barrier beach islands developed?
  (Note the number of towns on barrier islands)
- Have some of the marshlands been filled in?
  (What clues are there?)
- How might wildlife seek refuge?
  (Are there protected or undeveloped areas?)
- How have bays been used?
  (Are there cities, major highways, railroads in the area?)
- Where are the major ports? Why might they be located there?
  (Examine the size and shape of the bay and other waterways.)

Features Of A Coastline (Transparencies One and Two)



Activity 3: Wetland Values

Materials

- Student Handout 1: *Wetland Values, Part I*
- Student Handout 2: *Wetland Values, Part II*

Overview

The economic aspect of the wetlands is illustrated by the graphing exercise, Student Handout #1, and the math problems, Student Handout #2. They reinforce and emphasize wetland values from several perspectives.

Procedure

Since the exercises are short, they can be assigned at one time and completed well within a class period. The student instructions should be self-explanatory.

Comments and Suggestions

This activity presents several concepts which should be further pursued in a class discussion. Otherwise, the main points may be masked by the mechanics of graphing and calculation. The following brief list of questions and considerations may assist in developing a framework for discussing those ideas and drawing relationships to the information presented in the filmstrip.

- Who earns more each year from an acre of land? The owner of a farm or the owner of marshland? (Consider the idea of direct benefits vs. indirect benefits; the desirability of owning farmland vs. marshland.)
- How is the vegetation of the marshes used? Can all benefits be measured in dollar value? What are some of the less tangible benefits? (Review food chain of wetlands.)
- Why were marshlands once thought to be useless? How were they once used?
- How is sewage treated in your local community? (A brief review of sewage treatment may be useful for students' understanding of using wetlands as a treatment area.)
- Why is it not always possible to use wetlands as a wastewater treatment area? (Consider population growth in community, fluctuating output, etc.)
- What might occur if the treatment capacity of the wetlands is over-loaded? (Consider the consequences of disturbing the delicate balance of the ecosystem, polluting wetlands . . .) How might this be controlled?
- What are some of the reasons that motivate people to build extensively on the wetlands?
- What difficulties might a town encounter if it sets aside land to be left in the natural state? (Consider ownership rights, loss of tax revenues, limits to expansion, existing zoning regulations, etc.)
- Why do people build in flood prone areas despite their knowledge of the problem?
- Are developers concerned with the higher cost flood insurance when they develop a piece of property? Why or why not?
- Once an area has been built up, are there any ways in which it can be returned to a more natural state?
- In what ways can a densely developed coastal community protect itself from storm damage? Who pays for this?
- Consider some of the "pros" and "cons" of the following techniques which might be used to preserve wetlands:
  - direct purchase by government (state or federal)
  - providing scenic or open space easement
  - offering tax relief to property owners of wetlands
  - government pays owner not to develop

ANSWERS TO QUESTIONS, WETLANDS VALUE, PART II

1 a) 6,935 pounds
b) 8 acres

2 a) $350, $425, $500, $575
b) $100,000.

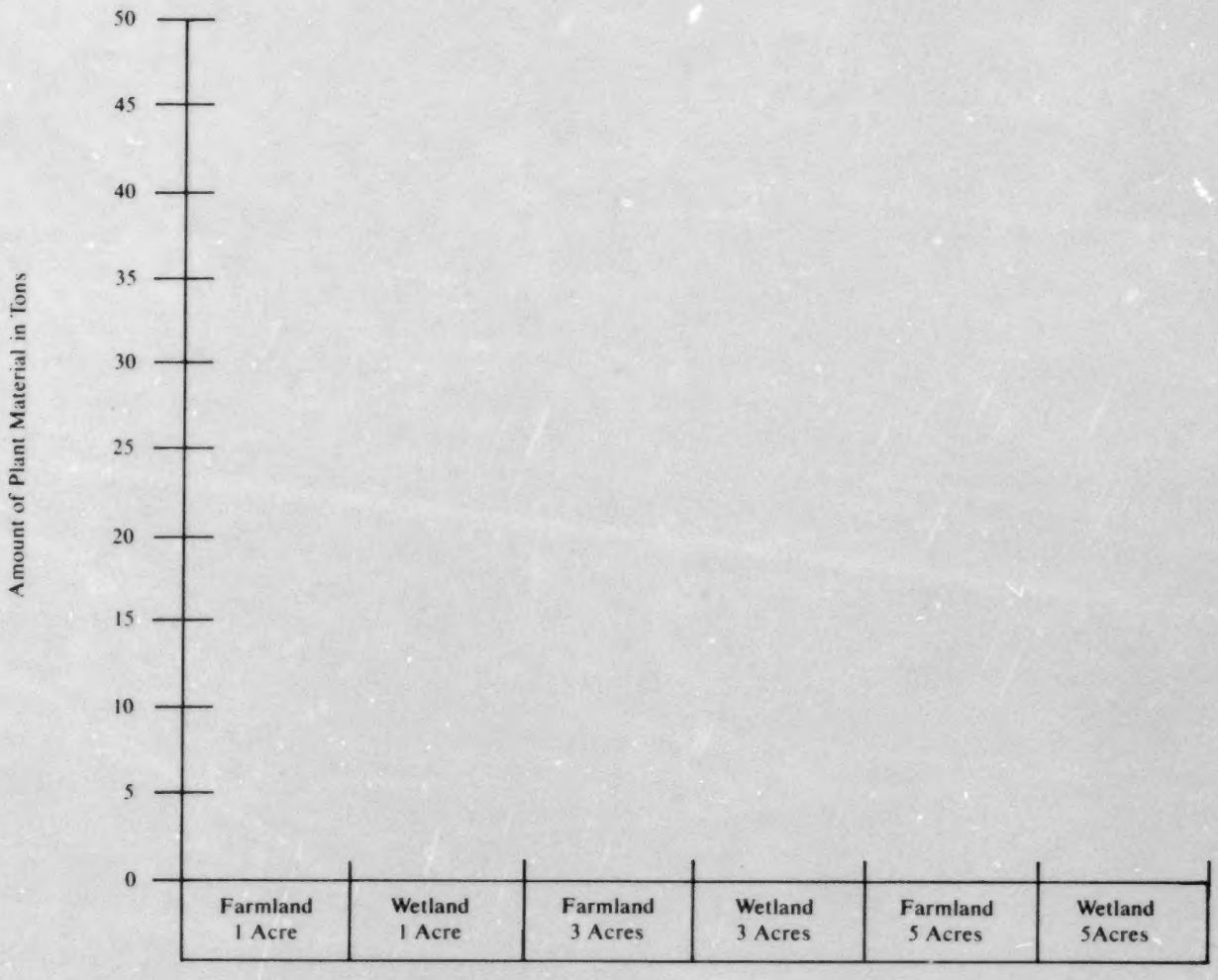
WETLAND VALUES PART I

Production of Wetlands and Wheatfields

Complete the bar graph below to show the amount of plant material produced on the wetlands and farmlands. Compare the production on 1, 3 and 5 acres.

- one acre of farmland yields ½ ton of wheat per year
- one acre of wetlands yields 5 tons of dry plant material per year

Plant Production in Wetlands and Farmlands



WETLAND VALUES, PART II

1. *Wetlands Sewage Treatment*

a) The town of Oceanville partially treats its sewage and then discharges it into the river which flows into the wetlands. If one acre of wetlands is capable of filtering and cleansing 19 pounds of pretreated sewage a day, how many pounds can it handle in a year?

b) How many acres will be needed if the town's average daily discharge is 152 pounds?

2. *The Wetlands and Storm Protection*

The wetlands provides storm and flood protection. For example, Oceanport has left much of its wetlands in the natural state and suffers very little property damage during the storms and the rainy season. On the other hand, Bayside has filled in and developed much of its marshland and lagoon. In a severe storm property damage always occurs in Bayside.

The following table illustrates the cost of flood insurance in the two towns:

	Flood Insurance Cost Per Year	
Value of the Property	*Oceanport*	*Bayside*
$20,000	$100	$ 300
$30,000	125	400
$40,000	150	500
$50,000	175	600
$60,000	200	700
$70,000	225	800
$80,000	250	1,000

a) If an Oceanport resident owns a $40,000 property, how much much less flood insurance would he/she have to pay than a person in Bayside owning property of the same value? $50,000 property? $60,000 property? $70,000 property?

b) Suppose there were 200 properties in Oceanport with an average value of $60,000; compared to Bayside residents, how much do the people in Oceanport save in insurance costs?

Activity 4: What Are Your Plans for This Land?

Materials

- Picture Pack containing set of five (5) photographs of coastal lands
- Student Handout 3: *What Would You Do With This Land?*

Overview

In this activity students, working together in small groups, will have an opportunity to make some decisions about the use of coastal lands. Examples of different areas are illustrated by photographs. In developing a proposal for the use of a particular land parcel, students should take into account the information they acquired from the preceding filmstrip and activities.

Recognizing that land development proposals require highly technical and sophisticated planning expertise, students, of course, will not be expected to begin to touch upon the many environmental impact issues. This exercise will primarily provide students an opportunity to take the perspective of a private landowner and gain some understanding of the reasons why coastal developments have proceeded in certain directions.

The amount of information provided is intentionally scanty. This gives students more creative latitude so that they can draw upon their own interpretations. This exercise will also help illustrate how we approached land use in the not too distant past, when building activity was unconstrained and our knowledge of environmental effects was more limited.

Procedure

- Have the students form into five work groups of 3 to 5 members.
- Each group will work with one of the pictures from the Picture Pack. Groups may wish to make their own selection, or alternatively, the pictures may be arbitrarily assigned.
- After students have examined the picture and read the accompanying caption, they will assume the role of the owner of the property and present his/her idea on how he/she will make use of the land. The proposal may be developed using a variety of formats: verbal descriptions, diagrams, drawings, magazine pictures, photographs or a combination of these. Encourage the students to be creative in their presentation. Their explanations of the proposal need not be more than five minutes in length.
- Each student is provided with a copy of Student Handout #3, *What Are Your Plans for This Land:* On it are the directions for the activity and a list of questions to help guide them in their proposal development.

Town Meeting

- The class will reconvene as an entire group and assume the new role of the town planning board.
- Representative(s) from each of the five groups will make their presentation.
- After all presentations have been made, board members may ask questions.
- The board members will then vote to approve or reject each proposal in turn. Remind students that they now represent town board members and should consider how the proposal might or might not benefit the town.

Comments and Suggestions

In recent years state governments have realized the importance of protecting the natural resources of the coastline and enacted legislation to regulate coastal activities. An example is the New Jersey Wetlands Act of 1970. This Act gives the authority to a state agency (N.J. Dept. of Environmental Protection) to map the wetland areas and to regulate activities in these areas. Regulated activities include: filling; dredging; draining; excavation; removal of sand, soil, mud or gravel; discharging liquid waste and building of structures such as buildings, piers, docks, bridges and so forth. Therefore, none of these activities may be undertaken without a permit issued by the agency. Even after an activity has received approval from the local municipal government, it must still undergo a review process by the state. Approval is granted only if the following conditions are met:

1. The activity requires access to the water or is water-oriented in its main purpose.
2. There is no other feasible alternative that is a non-wetlands site.
3. The activity will not significantly alter or impair natural tidal circulation, natural contour or natural vegetation of the wetlands.
4. Public health, safety, or welfare will not be jeopardized.
5. The ecological balance and wildlife of the area will not suffer.
6. The activity is in the public interest and will serve a public need.
7. Adjacent property, public or private, will not be unfavorably affected.

The proposals approved by the student town board may be further examined and discussed in light of some of the conditions. This will help extend students' awareness of potential consequences of a given type of activity. They may wish to reconsider whether or not the proposed activity is appropriate for that site.

See appendix for more detailed information on the N.J. Wetlands Act of 1970.

WHAT ARE YOUR PLANS FOR THIS LAND?

Questions for Consideration

1. After you have examined the picture and read the caption on the back, take the role of the owner of this property. Your ideas may be different from the person you represent. However, your task is to represent him/her and make sure his/her concerns and needs will be satisfied. Develop the best proposal for the use of this land; this will be presented at a town meeting. You will need to convince the town board to allow you to use the land in this way.
2. All the members of your group will be representing the same person, so first decide among yourselves what is most important to this person.
   - Why does this person want to develop the land? Profit? Own enjoyment? Town needs? If the person wanted to make a profit, what use would bring the greatest profits?
   - How might this person be affected if this land were not put to use?
   - What different ways can he/she use this land?
3. The caption may not include all the information about the picture. Examine the picture closely, and write down some other things you observe and conclude.
   - What plants live here?
   - What animals might use this land?
   - How important is this area to these animals?
   - How might this land be affected by building?
4. The person you represent has considered several choices.
   - What do you think about these choices?
   - Are there any other choices you might want to include or substitute?
5. Select a type of development (or no development) for this property. In making a decision think about:
   - Who might benefit from this type of development?
   - Who might not want to see this land changed?
   - What changes would come about if the land were developed?
6. You will present a five (5) minute proposal describing how you will use this land. In this presentation you will have to convince the town planning board to allow you to use the land in this way, so include all the advantages that you can think of.
7. To make your presentation interesting and appealing, you may wish to include:
   - diagrams
   - illustrations/drawings
   - pictures (photographs or pictures from magazines)
8. Group members may each present a part of the proposal or a spokesman may be selected to represent the group.

Captions Accompanying Each Photograph

1. ***Caption for "Beach Front Property"***

Owner: Steve and Mary Simes will soon be retiring and have long dreamed of a house on the beach. They have owned for many years four (4) adjoining beachfront lots (each approximately 100 feet wide) but do not have enough money to build unless they sell part of the property. So far they have two options: 1) They can sell three lots to other home builders, or 2) They can sell all four lots to a company that wants to build a motel. The company has offered them a large sum of money for the entire property.

Description: This beachfront property is located on the edge of town and adjoins the town beach. The town beach becomes quite crowded during the summer months, and because the land has been vacant swimmers and sunbathers frequently use this beach areas.

What should the Simes couple do? What is the best way to use this property?

2. ***Caption for "Marshlands in Industrial Surroundings"***

Owner: Martin James bought this 100 acre parcel of land for new development several years ago. Recently he formed a company and raised enough money to begin building. He felt that he paid a good sum of money for this land and wanted to make the most out of his investment.

Several possibilities have been considered which include town houses, a shopping center, or hi-rise apartments.

Description: This 100 acres of land lies directly across the river from a large metropolitan city and is linked to it by a good road system. On the other side of the property is a new sports complex that includes a racetrack, stadium and auditorium. The river bordering this land is wide and deep enough for good size pleasure boats.

What should Mr. James do? What is the best way to use this property?

3. ***Caption for "Crystal Bay"***

Owner: Stan Dayton, President of Rock Oil Company, has been buying thousands of acres surrounding Crystal Bay to expand the company's operations. Since the company has no oil refineries on this coast it has plans to use this site for a refinery and a long dock extending into the bay where the large oil tankers can anchor. Two other companies are interested in buying the land from Rock Oil. One wants to build a coal shipping terminal which also includes building an artificial island in the middle of the bay for the loading of the coal barges. The other wants to build a summer resort community.

Description: The undeveloped land surrounding Crystal Bay includes tidal wetlands and marshes as well as wide, sandy beaches. The bay is unique because it is one of the few spots along the coast that is deep enough for large ships, such as large tankers, to enter and unload materials. It is also calm and protected and has been a good harbor for boats to anchor overnight and for fishing and crabbing.

What should Stan Dayton do? What is the best way to use this land?

4. ***Caption for "Marshes Across From Resort City"***

Owners: Janice and Lily Gordon are sisters who inherited this land from their uncle. He was a hunting enthusiast who used the area for his private duck hunting grounds. The sisters are now approached by companies who want to go into partnership with them to develop the area. Several possibilities have been suggested: a private golf course, a large resort hotel or a natural gas distribution station. They feel that they can no longer leave the land in its natural state and continue to pay taxes on it without gaining some money back.

Description: This 200 acres of marshland is directly across from an island resort city which has again become a major tourist attraction because of its new casinos. Although the local residents are pleased with the increased tourist trade they would also like to see other types of industry come into the area. Then they will not have to depend entirely on tourists to make a living. Several miles north of this area is the state's largest wildlife refuge.

What should the Gordon sisters do? What is the best way to use this property?

5. ***Caption for "Old Dock Area"***

Owner: Jerry Keller's family has owned these docks since the turn of the century. This was once a bustling port area but has fallen to decay because it could not handle the large modern ships. Because of the high taxes that have to be paid on this property, Jerry feels that he can no longer let it sit idle and is considering redeveloping this area for factories, a private yacht club, or a supply center for the oil drilling operations that will soon begin off the coast.

Description: This two-block parcel of land lies north of the state's large shipping center and is therefore near railroad, highways, an airport and numerous trucking companies. It is also surrounded by aging urban communities. To provide recreational facilities the government has recently built a waterfront park a very short distance from this site.

What should Mr. Keller do? What is the best way to use this land?

Activity 5: The Outdoor Classroom — A Dilemma Discussion

Materials

- Student Handout 4: *The Outdoor Classroom*

Overview

This dilemma introduces students to conflicts arising from one of the common uses of the wetlands. The conflict revolves around the simultaneous need to find suitable disposal sites and the desire to maintain the wetlands as a wildlife refuge and educational study area. The moral issues in conflict involve the concepts of promise and trust and the rights of property holders.

Dilemma Discussion

Distribute copies of the dilemma for students to read and follow the basic procedure for conducting dilemma discussions as suggested in this Teacher's Guide, pp. 11-15.

Extending the Discussion: Alternative Dilemmas

These alternative situations may be introduced when the discussion draws to a close. They will help to further engage students in reflecting on implications of their choice.

It is now ten years later and a large number of school children have suddenly come down with a strange and severe illness. Public health officials, after a long series of testing, traced the disease to chemicals leaching out from the Owens' dump and contaminating the school grounds. The school was immediately evacuated and plans were made to relocate the school.

Many of the stricken children suffered permanent disability such as slurred speech, constant dizziness and loss of hearing. These problems required long and expensive medical treatments, and there was no guarantee that the children would ever fully recover. The parents were enraged and demanded that the town officials pay the medical bills and also for the suffering they endured.

Should the town officials be held responsible? Why or why not?

Should Mr. Owens be responsible because it was he who sold the land? Should everyone in town be responsible because they all contributed to the garbage? Why or why not?

Mr. Owens decided against selling the marshland and the town was left with the problem of finding a way to dispose of its garbage. One solution was to build a large incinerator plant since there were no other good dumping grounds nearby. Construction of this plant was very expensive, and the townspeople objected to paying higher taxes to fund the project. Also, the burning of garbage would introduce added pollutants into the air.

A group of townspeople met to discuss the problem and decided that they should try to convince Mr. Owens to change his mind. They planned to picket Mr. Owens' clothing store and convince people not to shop there until he changes his mind.

Should the townspeople take this action? Why or why not?

Dilemma 1 — THE OUTDOOR CLASSROOM

Tom Owens had promised the Washington School that he would leave his 100 acres of marshland next to the school undeveloped and allow classes to use it for science projects and field trips. Thousands of students had used the Owens marsh as an outdoor classroom. Here they studied birds, ducks, frogs and fish as well as marsh plants. One special study, the survey of migratory birds, proved to be so useful that it became a permanent student project, providing data and information to the state's wildlife agency.

Today the town mayor phoned Mr. Owens and explained that the town's garbage disposal situation has become a major problem. The town had grown rapidly in the past few years. Its dumping grounds filled more quickly than planned. The outlawing of ocean dumping had further added to the problem. Nearby towns also found that their dumps would soon be filled and would not accept garbage from outside towns. The mayor felt that the town had no choice but to expand its dump onto the Owens land. The money he offered for the marsh came as a big surprise to Mr. Owens. It was much more than Mr. Owens thought the land was worth. The money would allow him to fulfill his dream of a trip around the world.

Should Mr. Owens break his promise to the school and sell the land? Why or why not?

DISCUSSION QUESTIONS

- Should a promise ever be broken? Why or why not?
- Why should it be important to keep a promise?
- Does Mr. Owens have a right to go back on his word? Why or why not?
- Should Mr. Owens have the right to do what he wants with his property? Why or why not?
- Should the amount of money the mayor offered effect Mr. Owen's decision? Why or why not?
- Wouldn't Mr. Owens be helping the town by selling the land for a dump? Why or why not?
- Filling in the marsh will destroy the home and food of many animals. Does the town have the right to do this?
- If there is no other place to dump the garbage, shouldn't the town use whatever land that is vacant? Why or why not?
- What benefits might the town gain by leaving the marsh unfilled? Why?
- What use of the marsh should be more important to the town? Why?

Activity 6: "Water for Pottstown" — A Dilemma Discussion

Materials:

- Student Handout 5: *Water for Pottstown*
- Optional: 2 large sponges, tray, aluminum foil, glue, water

Overview:

The function of the wetlands as an important water reservoir and its link in the water cycle are the main focus of this activity. A review of the water cycle may reinforce the students' understanding of the issue in the dilemma.

Optional Activity/Demonstration:

The wetlands have often been described as a "sponge" capable of absorbing large quantities of rain and run-off waters. This idea can be illustrated as follows in a class demonstration or a small group project.

- Take two large sponges of equal size. Leave one "as is" to represent a marsh in its natural state. Have the other represent a marshland developed for a residential community. Cut out aluminum foil to represent houses, sidewalks and paved streets and glue them onto the sponge. (These should be sufficiently large in order to adequately illustrate the concept.)
- Place the two sponges in a pan and sprinkle equal amounts of water on each and observe the water absorption.
- Have students consider some of the ways in which communities channel rain waters to prevent flooding, property damage, etc.

Dilemma Discussion:

Follow the basic procedure for conducting discussions as suggested in this Teacher's Guide, pp. 11-15.

Comments and Suggestions:

This dilemma considers some of the reasons that led to legislation regulating wetlands development and requirements for environmental impact studies for land use activities. While the new laws are designed to protect a precious resource, it has raised the ire of private property owners who contend that the laws have rendered their property worthless. This poses the questions of what constitutes fair and just compensation to the landholders and who pays for their loss. Also, as land is removed from future development, remaining land values soar. For lower and middle-income groups buying a home at an affordable price becomes wishful thinking.

Extension Activities

Have the students conduct a debate between the residents of Pottstown and the residents of the marsh community. Divide the class into the two groups to develop the arguments for each side. In preparation for the debate the students should:

a) identify the main issues

b) prepare arguments on the issues

Have the students in small groups develop a solution that would be fair to everyone involved. They should include in their solution a strategy to convince each of the communities that it is to their advantage to accept this solution. (Students may wish to role play the meeting between the proponents of the solution and representatives of the communities.)

Dilemma 2 — WATER FOR POTTSTOWN

The marshes below Pottstown were filled by a developer. He then built a new community of 100 houses and a shopping center. The land was selected because it was cheap and there was a shortage of houses near the big city.

A few years after the houses were built, the neighboring Pottstown residents began to notice that their wells were not providing them with enough water. Also, the water had a strange, unpleasant taste. This worried the townspeople. An engineer was hired to study the problem.

In her study the engineer traced the problem to the marshland now paved over with roads and parking lots. The water which had formerly gone into marshes now ran into the river and out into the ocean. Before, the marshes stored great quantities of rain water and served as a reservoir for the wells of Pottstown.

Also, the brook running through Pottstown carried waste water from the paper mills and the unused fertilizer from the farms above the town. These waste materials once ran into the marshes. There the materials were cleaned by the biological activity of the marshes. Now the marshes no longer serve in this way, and some of these waste products go through the soil unchanged. They eventually mix with the well water. The engineer suggested that the residents stop using water from the wells as some of the chemicals might have harmful health effects. The only solution would be to build a water line to bring in water from Crystal Springs Lake.

The residents of Pottstown were enraged. Installing a water pipeline was expensive. They would have to buy water that they once got free of charge from their wells. They felt that the new marsh community had robbed them of their good supply of water. Therefore, they demanded that the marsh homeowners and the developer pay for the cost of the pipeline and the water.

The homeowners and developer refused. They argued that they did not directly pollute the wells or remove any water. So, there is no reason why they should be responsible.

The Pottstown case was brought before the court for its decision. Should the judge order the developer and new homeowners to pay for the pipeline? Or, should the judge decide that Pottstown pay for its own pipeline?

DISCUSSION QUESTIONS

- In what ways were the natural marshes important to Pottstown?
- Were the people of Pottstown unfairly affected by the new development? Why or why not?
- If the developer knew what would result, should he not be held responsible? Why or why not?
- Should the new homeowners be concerned about how their homes had affected the people of Pottstown? Why?
- Should the farmers and paper mill also be held responsible?
- Should the people of Pottstown always expect to have fresh well water? Why or why not?
- What should the court consider before making its decision? Why?
- The new homeowners had no way of knowing how the development might affect another town. Should they still be held responsible? Why or why not?
- Does the developer have a right to build houses and shopping centers in the marshes? Why or why not?
- Do people have the right to a clean and plentiful supply of water? How might this right be protected?

II. ACTIVITIES ALONG THE COAST

In this section the many ways people utilize the coastal zone and its resources are emphasized. Examples of problems and conflicts, such as beach access, competition for resources, extraction of a nonrenewable resource, serve to illustrate the importance of wise and effective management of this sensitive area. Some activities are incompatible with others, while overuse or misuse of some resources lead to irreparable loss of that valuable resource.

Activity 7: Showing of Filmstrip II: Coastal Activities

Materials

- Filmstrip II: *Coastal Activities*
- Cassette Tape II: *Coastal Activities*

Overview

The filmstrip surveys the multitude of activities that take place along the coast. For most students, a visit to the coast usually means the beach and swimming. Hopefully, this survey will convey to them a greater sense of the many activities taking place on the coast as well as the intense pressures placed on this natural system.

Comments and Suggestions

Prior to showing the filmstrip, have the students list activities they associate with the coast. This list may then be compared to the activities depicted in the filmstrip.

Coastal Activities: Picture Frames and Script

1 COASTAL DECISIONS: DIFFICULT CHOICES

2 AFFILIATIONS

3 TITLE PAGE: Coastal Activities

4 PHOTOGRAPH CREDITS

5 AERIAL VIEW OF COASTLINE
The coastal zone is made up of many different types of land areas.

6 WETLANDS
The wetlands which we explored in the first filmstrip is one aspect of the coastal zone.

7 WIDE STRETCH OF BEACH
Some areas have wide expanses of white sandy beaches.

8 ROCKY COASTLINE
Some are rocky.

9 BAYS AND CHANNELS
Others are characterized by calm channels and bays. Because of these special characteristics, people have made use of the coastal area in many different ways. However, we are not always in agreement on how our shores should be best used.

10 FISH MARKET
Perhaps one of the first things we associate with the coast is fishing. Today, many earn their living from fishing.

11 LEISURE FISHING
Others fish for relaxation and pleasure.

12 BOAT AT DOCKSIDE
Various types of activities and structures are related to the fishing industry. Docks and piers are needed for the boats. Processing plants and warehouses package and store the fish before they are sent to market.

13 FISHING COMMUNITY
Entire villages and towns are frequently built around fishing, providing supplies, repair services, boat construction, as well as housing for the fishermen.

14 PORT CITY
The importance of ocean shipping for transporting goods from one place to another is evidenced by the fact that the population of the United States has concentrated along the two coasts and the major cities are port cities.

15 SHIPPING
We are extremely dependent on shipping to bring us raw materials and products from other countries as well as to transport our products to sell elsewhere.

16 LARGE SHIP
Today's ships are, of course, much larger and carry millions of tons of cargo. To accommodate these large vessels, channels and bays often need to be widened and deepened. This is usually a large and costly project.

17 DREDGING OPERATION
It involves dredging mud and silt from the sea bottom, using enormous vacuum cleaner-like machines. These dredged materials are then deposited elsewhere, frequently along a nearby shoreline. Dredging, however, can disturb fishing grounds and shellfish beds.

18 LOADING CRANES — PORT NEWARK
Our Atlantic coast ports are among the busiest in the world. Rapid loading and unloading is an important objective. The use of large containers to ship goods has drastically changed the way we handle cargo and the type of equipment found on the docks.

19 TRAILER TRUCKS
Giant cranes now lift the containers from the ships directly onto tractor trailers. These containers need not be opened from the time they leave the factory until they arrive at their destination.

20 BEACH SCENE
Many of us at one time or other have been tourists at the seashore. There we may just sit to enjoy the sun and ocean spray or engage in more active recreation such as boating, swimming, surfing or fishing and clamming.

21 WATERFRONT RESORT COMMUNITY
Catering to our leisure time desires, some coastal communities are primarily resort communities and can be characterized by their sudden surge of activity when summer rolls around.

22 HOTEL
Here one finds hotels,

23 MOTELS
motels, summer cottages, trailer parks and campgrounds.

24 AMUSEMENT RIDE AT PLAYLAND
In addition to water type activities, we frequently find amusement rides and entertainment facilities built along boardwalks.

25 BOARDWALK
Tourism along the coast is a multi-million dollar business.

26 RESORT HOTEL UNDER CONSTRUCTION
Resorts near the large cities have experienced rapid growth to accommodate visitors seeking relief from the hot summer heat.

27 COASTAL RESIDENTIAL DEVELOPMENT
A home on the beach is for some people the ultimate place to live year 'round. And, for a fortunate few, the beach is their backyard. However, beachfront homeowners do have a few problems that inland dwellers do not encounter.

28 STORM DAMAGE DWELLING
Wind and wave action from severe ocean storms can sweep away entire communities. To adequately protect against this type of natural event is extremely expensive and beyond the means of most homeowners. In addition, movement of the shoreline is a natural process. However, no one appreciates the losing of sand from one's own beach.

29 OCEANFRONT HOME WITH SEA WALL AND GROIN
Property owners try to prevent this natural drifting of sand by building seawalls, groins or jetties to keep the sand on their own beaches. These structures may help keep sand on one beach but often rob sand from the beach next to it.

30 AERIAL VIEW OF GROINS ALONG BEACH
As a result, more groins or jetties are built, and in many developed areas the beachfront is a continuous row of groins or jetties.

31 GARBAGE DUMP
An activity we do not often associate with the coastal zone, but which we all contribute to, is garbage dumping and land filling of marshes. At one time we thought marshy swamps were useless and much of this land was turned into garbage dumps.

32 POLLUTED WATER NEAR DUMP
We are now experiencing the consequences of these thoughtless activities such as the polluted waters, fish kills and destruction of wildlife habitats.

33 POWER PLANT
To supply sufficient electricity for our large population, numerous electricity generating facilities are needed. The plants produce much heat, and large quantities of water are required for cooling. Consequently, many power plants are located along coastal and ocean waters because there is no charge for using these waters.

34 WATER FROM PLANT
However, the water that has cycled through the plant is now warmer and this in turn increases the temperature of surrounding waters. This changed condition may or may not be suitable for the plants and animals that presently live there.

35 SMOKE PLUME FROM POWER PLANTS
Also, plants that use fossil fuels emit a number of air pollutants, clouding the skies and threatening our health.

36 AERIAL VIEW OF DRILLING PLATFORM
As we begin to drill for oil and gas off the coast to meet our energy needs, new activities will take place on the shorelines.

37 HELICOPTER ON DRILLING PLATFORM
Getting the oil from under the ocean floor includes more than building the drilling platform.

38 SERVICE BARGE
Onshore ports will be needed to dock and service the barges and boats ferrying men and supplies to and from the platform. Repair yards will be located nearby to service and maintain the boats.

39 OFFSHORE BASE
New warehouses will store equipment and supplies. When the oil is brought in by pipelines, pumping stations are needed to send the oil to refineries for processing.

40 OIL REFINERY
At the refinery the oil is transformed into gasoline, heating oil and other products.

41 VIEW OF SUPPORT FACILITIES
With the development of offshore oil fields new structures will appear along the coastline, harbors will be enlarged, and commercial boat traffic will increase. Such development is not always welcomed by everyone, especially beach resort communities and vacationers expecting a serene beach scene. Fishermen may fear that pipelines and dredging operations will interfere with their fishing grounds. Finding appropriate sites for the many activities associated with oil production may be, indeed, a difficult task.

42 CLOSED BEACH
Added to these concerns are the possibilities of oil spills that may very well close off beaches and swimming areas, not to mention the disasterous effects on fish, birds and other wildlife. Yet, oil is so very important to our transportation and electricity needs.

43 PORT
Ports,

44 RESORT COMMUNITY
resort communities,

45 WATER FOWL
water fowl,

46 BEACHES
beaches,

47 SURF CLAMS
surf clams and

48 FACTORIES BY THE WATER'S EDGE
factories are all part of the many resources of the coastal zone. They all depend on the coast in many ways.

49 MEN WORKING
For some the coast means jobs and food;

50 BEACH SCENE
for others it is a place for pleasure and relaxation.

51 GARBAGE LANDFILL
If these valuable resources are used carelessly, severe damage can result. It may be difficult to remedy the damage or replace the loss.

52 OVERVIEW OF COAST
We must all share in the responsibility to see that our coast is managed well so that it will continue to serve our many needs.

Activity 8: Discussion of Filmstrip II

Materials

- Student Handout 6: *Activities and Changes Along the Coast*
- Worksheet

Overview

The worksheet will assist students to summarize the ideas presented in the filmstrip as well as lead them to consider how the various activities require changes in the natural coastal environment. The concept to be emphasized is that activities are not isolated but encompass many different interactions and interdependencies.

Procedure

The worksheet should be filled out individually

Comparison of the results may be made in small groups or with the entire class. The multiplicity of changes and impact are readily revealed as students begin to pool their interpretations as to what they view as significant changes.

Compile the list of what the students judge as most important coastal activities. The list can be compared to the major coastal activities of this state or another coastal state.

Comments and Suggestions

To highlight the many changes that can arise from a single activity, have the students take one activity and trace a sequence of developments in the form of a diagram or flowchart. One can then begin to see how one activity is dependent on a variety of other activities and support systems. Consider, for example, the fish sandwich one buys at the drive-in. Some of the components in the sequence would involve the following:

- Spawning grounds;
- Food for the fish;
- Fishermen and fishing boats;
- Fuel and supplies for the boats;
- Fish processing plants;
- Fish wholesalers;
- Cold storage warehouses;
- Trucks to distribute the fish;
- Cooking the final product.

Each component also depends on other prior developments. A complex web of interactions soon unfolds. Such a web can be developed as a class activity.

ACTIVITIES AND CHANGES ALONG THE COAST

A number of coastal activities were discussed in the filmstrip. Identify four which you feel are important to you. List them below and for each indicate coastal changes that resulted (column #2) and how you benefit (column #3).

ACTIVITY	What needs to be built or changed in order for this activity to occur	How do *you* benefit from this activity?
1.		
2.		
3.		
4.		

Activity 9: Crabbers and Shrimpers — A Dilemma Discussion

Materials

Student Handout 7: *Crabbers and Shrimpers*

Overview

This dilemma focuses on a problem between two groups fishing the same waters and reflects a number of issues that have, in some instances, reached international proportions. These include such issues as whaling quotas, rights to fishing grounds, overfishing, methods of fishing and national boundaries.

Dilemma Discussion

Follow the basic procedures for conducting dilemma discussion as suggested in this Teacher's Guide, pp. 11-15.

Comments and Suggestions

Current news items on fishing rights may provide a basis for students to develop similar dilemmas of their own. Students may also find it interesting to act out this or another related dilemma.

Extending the Discussion: Alternative Dilemma

The crabbers start patrolling the waters to keep the shrimpers out of the area. One evening a shrimp boat did not heed the warnings shouted from the crabbing fleet and crossed into the waters where the crab pots were set. Overhead shots were fired to scare the shrimp boat away, but one shot accidently fell too low and a man was killed. Should the crab fishermen be charged with murder? Why or why not?

Is this situation the same as trespassing on private property? Why or why not?

Were the shrimpers inviting trouble by crossing into the area? Why or why not?

Should all crabbers be held responsible? Why or why not?

Suppose the shrimpers had fired back. Would that make a difference in the decision? Why or why not?

Suppose Robby Porter knew who had fired the shot. Should he tell the authorities so that they will not have to bear the blame and consequences of imprisonment? Why or why not?

Dilemma 3 — CRABBERS AND SHRIMPERS

Robby Porter earns his living as a crabber. He catches crabs in the shallow waters off the coast, one of the few areas in the world for commercial trapping of stone crabs. Each day he drops from his boat lines containing hundreds of large wooden traps down to the ocean floor and returns the following morning to collect his harvest.

Recently Robby has lost many harvests as well as his traps because of shrimpmen fishing so close to his lines. When the shrimp fishermen cast their fifty-foot nets they entangle the crab traps and break the lines. They also move the buoys that mark the site of the traps.

Having no success in his many attempts to reason with shrimpers and keep them away from the area, Robby has decided to patrol this crabbing site with shotguns. Any shrimpers crossing into the area will be fired upon. This, he felt, would be the only way to protect his livelihood.

Should Robby take this action? Why or why not?

- Since crabbing is the way these men earn a living, do they have a right to try to protect their jobs? Why or why not?
- This is the only area where stone crabs are found in large quantities while shrimp can be caught in other waters. In such a case shouldn't the shrimpers respect the demands of the crabbers? Why or why not?
- Should one group of fishermen have the right to keep others from fishing the same waters? Why or why not?
- Can the first comers claim the rights to fish the waters and keep out all others? Why or why not?
- Since the shrimpers do so much damage to the crabbing lines, shouldn't they be kept out of the area? Should any method be used to keep them out? Why or why not?
- If you were a shrimp fishermen, would you think it unfair for someone to try to keep you from fishing in certain places. Why or why not?

Activity 10: A Beach Survey

Materials

- Student Handout 8: *Beach Survey Form*
- Student Handout 9: *Beach Survey Results*
- Overhead Transparency 3: *Summary of Survey*

Overview

The compilation and analysis of the survey results are employed as a means to examine different types of beach development and differing approaches to beach management as reflected in policies regulating public access to beaches. In conflict are the constitutional principles of property rights and the public trust doctrine. How the states interpret and apply the principle of common law is thus illustrated in the ways beaches are made available for public use. Information about beach access and usage will be derived from the student's personal experiences and will serve to create awareness of the issue in the following dilemmas.

Background Summary of Beach Access Issues

The concept that certain objects are intended for all people can be traced back to Roman law. These common trust elements include air, water, sea and seashore. However, when we consider the fact that 70 percent of the United States shoreline is privately owned, the notion of the seashore as a common trust does not seem to have been vigorously pursued. Yet, we recognize the unique nature of our beaches, their aesthetic and recreational offerings and the need to maintain and preserve beaches for people now and in the future.

According to U.S. law, the states have jurisdiction over lands and territorial waters from the mean high tide mark to three miles out to sea. This strip is held as public trust. How the states have regulated the area from the mean high tide point in actuality determines the extent to which this trust is made available to the public. When much of the shoreline is privately owned, access to the beach is a near impossibility without trespassing through private property. In many cases, elaborate measures are taken, such as fences, walls and guards, to keep the public off the beaches.

With population growth, increasing urbanization, mobility, and more leisure time, beach use had increased and some public beaches located nearby large urban centers have had to limit attendance on certain hot, sultry days because of overcrowding. Often, people must drive great distances in search of a public beach when long stretches of shoreline are privately held and developed. And, upon arriving at a public beach they met by a ticket collector, because a fee is charged to enter the beach area.

While a few states such as Texas and Oregon have extended their common trust line from the high tide line up to the vegetation line to ensure greater public access, most states have clung to the high tide line. Often, these are the more heavily populated states which have long since sold much of the shoreline to private development, establishing the tradition of uninterrupted privately held property as well as inland water (riparian) rights for special uses such as shellfishing, docking facilities, etc. Conflicts, therefore, arise in delineating the rights of property owners and the rights of the public. Despite our legal claim to use the sea's edge, that right cannot be realized unless people can get onto it. On the other hand, the right to property is a constitutional guarantee. We can question the wisdom of states selling beaches to private owners, but this is a moot point after the fact. The problems of accommodating increasing beach traffic and limited beach space still remain.

Other conflicts also arise in situations where states have granted local municipalities the power to manage their beachfront. Here maintenance and operation of the beaches are paid for by local residents through their taxes. Hence, residents have the extra burden of providing for the recreation of outsiders who flock into their towns. Most municipalities levy a beach user's fee. In certain instances this may be a substantial sum and used in a discriminating manner, such as club membership or exhorbitant parking fees. For those less affluent, these fees preclude their use of the beach.

Beach access thus highlights a number of issues of conflicting interests and raises the question of how best to manage the coastal zone to benefit all concerned.

Emphasis in the past was on industrialization and economic development. Only more recently have we recognized the importance of our recreational needs and beaches serving to meet that need. While much cannot be done to undo past developments, greater diligence can be applied to future decisions.

Procedure

Conducting the Survey. Have each student personally answer a survey questionnaire, if most students have had opportunities to visit beaches. However, if a number of students have never been to the shore, it may be less threatening or embarrassing to have the class conduct the survey as an outside project, interviewing friends or neighbors. In addition to completing a personal form, each student may wish to survey one or two other persons. This would increase the sample size and the probability of obtaining a greater diversity of responses. If possible, students should try to interview persons who have recently lived in another part of the country.

Tabulating the Results. The completed survey forms should be sorted into the following four categories: national park, state park, town beach and private beach. Divide the class into four groups to work on tabulating the results of each category on the summary score sheets. (Each student may fill out this sheet or a single form may be filled out for the group. However, having all students fill out the form is a good learning exercise and further ensures student participation and interest.) There may be few responses in a category (e.g., *national park beaches*) and number of students working on this category will need to be adjusted accordingly.

Your experience with the students should determine the amount of instruction required for tabulatng the results. To complete this task it is important that the stu-

dents recognize the need to work cooperatively. Establish this notion by having the students first decide on the most effective procedure for recording the data before proceeding. Some suggestions might include:

- Compare the survey form with the tabulating sheet. Note that question numbers do not coincide with the tabulating sheet. How will the students make the necessary adjustments?
- What symbols will the students use to tabulate the frequency of responses?
- Select student(s) to read out the results while others record.
- In what ways can the accuracy of the tabulations be checked?
- How can they summarize the last three questions which are open ended?
- If the person surveyed did not know who had jurisdiction over the particular beach, how can that information be obtained? Can any inferences be made from the responses?
- Would it be easier to take each form in turn and tabulate all the responses or tabulate one question at a time?
- The students tabulating the private beach surveys will need to devise a method for keeping count of beaches requiring membership fees and indicating the range of the fees.

Comparing and Interpreting the Findings. Upon completion of the tabulations and tallying the responses, the class will reconvene to report their results. These results may be recorded on transparency #1, *Summary of Beach Survey,* to facilitate comparison of the different types of beaches. The following are some questions which might be useful in analyzing and comparing the results.

- What types of beaches charge the higher entrance fee? Along which coast are they located?
- What types of facilities are provided at the different beaches?
- What types of beaches were most frequently visited? Why do you suppose this is the case?
- From among the people surveyed, what conclusions can you draw regarding their preferences? Why? What seems to be a favorite activity?
- Did many people visit beaches located long distances from their homes? How might a gas shortage situation affect beach use? (On an outline map, pinpoint locations of the beaches visited and determine the average distances traveled.)
- What types of regulations or rules were employed to control the use of the beach?
- What means are used to limit public use of some beaches?
- What rules are found to be common for most beaches? Which ones are different?
- Are residents and nonresidents charged the same fee for admission onto town beaches? Should nonresidents be expected to pay more? Who should pay for maintaining the beach? Why?
- If the state government maintained the beaches, tax monies would be used for the upkeep. Should people who don't use the beach have to contribute?
- What changes might you like to see in the management of beaches in your state?
- Might the fees charged for using the beaches prevent those who are less able to pay from visiting the shore? Is this fair?
- If people have more leisure time (i.e., four-day work week), would beach attendance be affected? Might beaches become overcrowded? Would it become necessary to limit the number of beach visitors? How might this be done?
- Are there beaches where one cannot get to because property in front of the beach is privately owned and fenced off in some way?
- Motel/hotel beaches do not usually charge their guests. Are the guests paying in other ways? Are nonguests allowed on the beach?

BEACH SURVEY

1. What beach did you last visit?

_____ _____
Name of Beach State

2. The beach was a (check one)

_____ national park _____ private beach club

_____ state park _____ privately owned beach (e.g., house built on beach)

_____ town beach _____ hotel/motel beach

3. Did you have to pay to use the beach?

_____ yes _____ no

If yes, approximately how much did each person pay?

_____ approximately $1/day _____ between $2 and $3/day

_____ over $3/day

Was a beach tag or other type of identification needed?

_____ yes _____ no

Does the beach allow only members or residents?

_____ yes _____ no

If the beach was a private club beach how much was the membership fee? _____

4. What *other* fees did you or your family pay? (check items)

_____ parking _____ locker room/shower

_____ other - please list below

_____

_____

5. The beach was

_____ crowded _____ uncrowded

5a. Does the beach limit the number of people that it can accommodate?

_____ yes _____ no _____ unknown

6. The area around the beach was

_____ undeveloped (natural state, e.g., dunes, rocky cliffs, with a few surrounding buildings or other man-made structures)

_____ developed (housing; motels/hotels/shops; boardwalk)

7. Check those facilities or services that are found at the beach you visited

_____ amusement rides _____ food and game concessions

_____ boardwalk _____ lifeguards

_____ gates and fences _____ camping facilities

_____ piers _____ restrooms/showers

_____ _____
other

8. What did you do at the beach?

_____ water sports (swimming, surfing, etc.)

_____ fishing, clamming, crabbing, etc.

_____ sun bathing, _____ amusement rides, games

_____ camping _____ _____
other

9. Were there any rules stating what types of activities were prohibited on the beach?

_____ yes _____ no

What were they? _____

_____

_____

10. What did you like most about this beach?

_____

_____

_____

_____

11. What did you like least about this beach?

_____

_____

_____

_____

12. Briefly describe your feelings or impressions of this beach:

_____

_____

_____

_____

BEACH SURVEY RESULTS

1. Type of beach (question 2)

_____ _____
(federal, state, municipal or private) (total number)

2. Location (question 1)

____East ____West ____Gulf Coast ____Great Lakes

3. Fee

____ None
____ Approximately $1/day
____ Between $2 & $3/day
____ Over $3/day
____ Resident only
____ Club membership $____
____ Beach tag

4. Other Fees

____ Parking
____ Locker Room/Shower
____ _____
____ _____
____ _____
____ _____

5. Beach Conditions (questions 5 and 6)

____ Crowded
____ Uncrowded
____ Limits number of people
____ Developed
____ Undeveloped
____ No limit on number of people or unknown

6. Beach Facilities, Attractions, and Services (question 7)

____ Amusement Rides
____ Food & Game Concessions
____ Boardwalk
____ Rest Rooms/Showers
____ Lifeguards
____ Gates, Fences
____ Camp grounds
____ Piers
____ _____
other

7. Beach Activities (Question 8)

____ water sports
____ fishing, clamming, etc.
____ sun bathing
____ amusement rides
____ camping
____ _____
other

8. Types of restrictions (Question 9)

_____ _____
_____ _____
_____ _____

9. Summary of good features of this type of beach

_____
_____
_____

10. Summary of undesirable features of this type of beach

_____
_____
_____

SUMMARY OF BEACH SURVEY

National Park Beach	State Park Beach	Town Beach	Private (Club, Residence, Hotel/Motel)
Number ____ total	Number ____ total	Number ____ total	Number ☐ total
Location: ☐ east ☐ west ☐ Gulf	Location: ☐ east ☐ west ☐ Gulf	Location: ☐ east ☐ west ☐ Gulf	Location: ☐ east ☐ west ☐ Gulf
Fee: ☐ none ☐ $1/day ☐ $2-3/day ☐ + $3/day ☐ beach tag	Fee: ☐ none ☐ $1/day ☐ $2-3/day ☐ + $3/day ☐ beach tag	Fee: ☐ none ☐ $1/day ☐ $2-3/day ☐ + $3/day ☐ beach tag	Limited to: ☐ residents only ☐ yearly membership ☐ guest of hotel/motel ☐ open to public
Other Fees: ☐ parking ☐ locker room ☐ _____ ☐ _____ ☐ _____	Other Fees: ☐ parking ☐ locker room ☐ _____ ☐ _____ ☐ _____	Other Fees: ☐ parking ☐ locker room ☐ _____ ☐ _____ ☐ _____	Other Fees: ☐ parking ☐ locker room ☐ _____ ☐ _____ ☐ _____
Beach Conditions: ☐ crowded ☐ uncrowded ☐ developed ☐ undeveloped ☐ limit capacity	Beach Conditions: ☐ crowded ☐ uncrowded ☐ developed ☐ undeveloped ☐ limit capacity	Beach Conditions: ☐ crowded ☐ uncrowded ☐ developed ☐ undeveloped ☐ limit capacity	Beach Conditions: ☐ crowded ☐ uncrowded ☐ developed ☐ undeveloped ☐ limit capacity
Beach Facilities: ☐ amusement rides ☐ food & concession ☐ boardwalk ☐ restrooms ☐ lifeguards ☐ gates, fences ☐ campgrounds ☐ piers ☐ _____ ☐ _____	Beach Facilities: ☐ amusement rides ☐ food & concession ☐ boardwalk ☐ restrooms ☐ lifeguards ☐ gates, fences ☐ campgrounds ☐ piers ☐ _____ ☐ _____	Beach Facilities: ☐ amusement rides ☐ food & concession ☐ boardwalk ☐ restrooms ☐ lifeguards ☐ gates, fences ☐ campgrounds ☐ piers ☐ _____ ☐ _____	Beach Facilities: ☐ amusement rides ☐ food & concessions ☐ boardwalk ☐ restrooms ☐ lifeguards ☐ gates, fences ☐ campgrounds ☐ piers ☐ _____ ☐ _____
Restrictions: ☐ _____ ☐ _____	Restrictions: ☐ _____ ☐ _____	Restrictions: ☐ _____ ☐ _____	Restrictions: ☐ _____ ☐ _____

31

Activity 11: "On the Beach" — A Dilemma Discussion

Materials

- Student Handount 10: *On the Beach*

Overview

In the preceding activity students compiled the background information for the discussion of the public beach access issue that underlies this dilemma. However, the question to be resolved in this dilemma is whether or not the boys should break the law.

Dilemma Discussion

Follow the basic procedures for conducting dilemma discussion as suggested in this Teacher's Guide, pp. 11-15.

Comments and Suggestions

Additional aspects of the public beach access issue are discussed in a recent article by Anthony Wolff. This is found in the Appendix Section of this guide. Also, the article "Minister Fights Beach Tags", a UPI release, reprinted from *The New York Times*, may be used as an alternative dilemma for class discussion.

Extension or Alternative Activity

The following courtroom role play simulation may be conducted after the dilemma discussion or conducted in place of the discussion activity. The legal conflicts surrounding the issue of beach access can be explored in greater depth in this activity.

Trespassers on Trial

Setting

Barry and his friends have been caught trespassing. They are arrested and are now brought to trial. Each defendent will argue his or her own case before a judge and panel of jurors.

Roles

Barry; Friends (boys and girls, the number may be flexible depending on the size of the class); Judge; Prosecuting Attorney(s); Jurors.

Procedures

- The judge will direct the trial, calling upon defendents in turn and maintaining courtroom decorum. He/she will keep track of the time allotted the defendents to plead their case. (To insure that each defendent has equal time, a time limit should be determined prior to the trial.)

- To increase student involvement a different prosecuting attorney will serve in cross examining each defendent. If the class is small, one person can conduct all the cross examinations.

- The remaining members of the class will serve as jurors. They will determine the guilt or innocence verdict of each defendent separately. They are to base their judgment on how well each defendent argues his/her case and the evidence/exhibits presented. A simple majority of votes will suffice in this simulation. (To heighten the simulation, the jurors may be instructed to pronounce an "innocent" verdict for only half of the defendents. This condition will challenge each defendent to prepare a well-developed, logical defense.)

- In developing their defense, the students on trial may wish to pursue the following ideas:

- The concept of the seashore as public domain held in common trust by the states.
- The notion of levying a beach user's fee as discriminatory against non-residents
- The legitimacy of levying a fee for permit to access onto a public domain area — all the sand below the high tide mark.
- The lack of scarcity of public access thoroughfares in areas where much of the beachfront is privately owned.
- The question regarding whether or not the rights of the public to beach access have been upheld.

Dilemma 4 — ON THE BEACH

The day was hot and muggy without a trace of breeze. Barry and his friends could think of nothing to do; it was too hot to play any type of game. Then someone came up with the idea, "Let's ride our bikes over to Seaside and sneak onto their beach for a swim! I know a place along the fence where the lifeguard wouldn't be able to see us. None of us have the $4 to pay the beach charge, but we could surely use a swim to cool off!"

The thought of a swim was most tempting to Barry, but he worried about getting caught. Only the people who lived in the town of Seaside could use the beach free of charge; people caught for not paying would be arrested and fined $100 for trespassing.

Should Barry go along with his friends? Why or why not?

DISCUSSION QUESTIONS:

- Is it wrong for the youths to try to sneak in without paying? Why or why not?
- Is sneaking in without paying the same as stealing? Is it ever right to steal? Why or why not?
- Since the town maintains the beach, shouldn't it have the right to make the rules governing its use?
- Residents of beach towns pay taxes to keep the beaches clean and hire lifeguards. Should they not charge outsiders a fee to use the beach? Why or why not?
- Should the youths have to pay to use the beach when the local residents use it free of charge? Why or why not?
- Should they be fined if they were caught? Why or why not?
- How might a beach community be affected if everyone tries to get onto the beach without paying?
- Should the people of a beach community have the right to determine who may use their beach? Why or why not?
- If you owned a house on the beachfront, would you want people tramping across your yard to get to the beach? Why? What might you do?
- Many people pay large sums of money for beachfront property. Should they be required to open their beach to anyone who wants to use it? Why or why not?
- Should people be allowed to build along the beachfront and keep the public off the beach? Why or why not?
- What good reasons are there to keep beaches open to everyone without charge? Who would pay for keeping the beaches clean and hire lifeguards?
- What might be the best way to make sure that everyone can enjoy the use of the beaches?

Activity 12: "Home on the Beach" — A Town Meeting Debate

Materials

- Student Handout 11: *Home on the Beach* (background of the problem)
- Student Handout 12: *How Should the Town Council Decide?* (instructions for preparing the presentation for the town meeting)
- Student Handout 13: *Viewpoints of the Town Committees*
- Student Handout 14: *Worksheet for Identifying Main Arguments*

Overview

A simulated town council meeting is the format used for the discussion of this dilemma. The viewpoints presented by each committee should provide students with some understanding of the problems associated with development of beachfront property.

Procedure

- The student instructions and worksheets are self-expanatory. Each student group will receive the role card describing the position of the committee it represents. Alternatively, students may be given copies of all the viewpoints and become familiar with all the positions before preparing their own case. (Student handout #13. — Cut and distribute as role cards or distribute in its entirety)
- Preparation time and length of each presentation should be determined at the onset. Also, the rules for questions and rebuttals should be established.

Comments and Suggestions

Some classes may find that additional outside research can provide useful data to enhance their presentation. Some pertinent topics might include: beach erosion, sand dunes, coastal storms and property damage, real estate values on the coast, shore protection, and beach nourishment.

Dilemma 5 — HOME ON THE BEACH

Jerry Knowles lost his beachfront house during a recent hurricane. The strong winds literally lifted his house off the ground and smashed it against the house next door. Fortunately, Jerry had joined the government flood insurance program and was able to collect $35,000 for the damages. With the money he plans to rebuild on his beach property, just as he did after a storm six years ago.

Although this area is frequently hit by severe storms, Jerry and his family love living by the ocean where they enjoy swimming and boating right in their front yard. They have lived here most of their lives and do not want to move elsewhere.

However, the town recently passed a new rule that created a problem for the Knowles' family. The town council felt that it was unsafe to build houses so close to the water and ordered that all new buildings must be placed 300 feet back from the high tide mark. This meant that Jerry could not rebuild on his land, because his property extended back only 200 feet. He, of course, felt that this was most unfair and went before the town council to appeal the new ruling.

Arguments Presented at the Town Meeting

Jerry Knowles' Argument — I have worked long and hard for my land and home. This is my property and I have the right to build my home here. No one should tell me where I can or cannot build. When I bought the land, I was allowed to build. If I were able to build then, why should I not be able to rebuild again? What good is my land if I can't use it? I paid a handsome sum for the beachfront, and now it's worthless if I can't build on it. I'm willing to take the risk, because my family and I want to live here.

Sam Carter, Lawyer Who Wrote the New Town Ruling — This new ruling was enacted for everyone's benefit. Building on a storm-prone dune beach is sheer foolishness. It's not possible to be absolutely protected from the forces of nature. Sure, Mr. Knowles received insurance money for rebuilding. But where does that money come from? Our taxes! That means we are paying for his enjoyments of a beach home. Why should the public bear the responsibility of his foolish act? It's one thing to help someone out in a disaster. However, we can't continue to pay for rebuilding a house that may again be washed away.

We also have to think of the importance of the sand dunes which protect houses further back inland. In time of storm, dunes help break the power of the storm waves. Forces of the wind and water are reduced, and damage to property further back is lessened. When buildings are put on sand dunes, roots of the grasses which hold the sand are loosened. Wind and waves can now easily carry off the sand and destroy the dunes. If dunes are left in the natural state they can rebuild again naturally after storm damage. Building on the dunes brings changes and prevents nature's own restoration process from taking place. This results in loss of much beach area.

How should the council decide?

Home on the Beach

HOW SHOULD THE COUNCIL DECIDE?

Instructions

Each student will serve as a town council member and represent one of the following committees:

- Beach Management Committee
- Beachfront Property Owners Committee
- Real Estate Development Committee
- Recreation Committee

Committee Meeting:

Meet in your (assigned/selected) committee and examine the viewpoint that you will be representing. (Each committee member will receive a card describing that committee's point of view.) Make sure everyone in the group understands the committee's concern before proceeding.

What are the major concerns of your committee?

Why do you think they are important?

In you committee meeting identify and discuss the major arguments presented by Mr. Knowles and Mr. Carter. On the worksheet you received indicate their major arguments. Decide among yourselves the importance of each of the arguments from the viewpoint of the committee you represent. For each argument assign an importance score. This worksheet will be used for later reference.

Your task is to develop a solution for the town council. What is the best solution for the Knowles case which will be fair to all persons? Refer to the worksheet you completed to assist you in forming your ideas. This solution will be presented at the next town council meeting, and the members will vote on the best solution. Therefore, it is important that you present good reasons for supporting your solution.

- What are the main issues?
- Who will benefit? Why?
- Who might have to make sacrifices: Why?
- Does it go against people's rights? Why?

Select member(s) of your group to present the committee's recommended solution.

Town Council Meeting:

The class will meet again as a single group to conduct the town council meeting. Each presenter will first identify the committee he/she represents and give a brief summary of the committee's point of view before presenting the solution developed by the committee.

After each committee presentation, council members will have an opportunity to question members of the committee.

Upon completion of the presentations the council may wish to further discuss the issues and the proposed solutions.

The council members will vote on the best solution to the problem. How should the council decide on the Jerry Knowles case?

Should the town keep its ban on beachfront building? Why?; Should Mr. Knowles be allowed to build? Why?; Is there another solution?

Carefully consider the following questions before voting:

- What should be the responsibility of the council? Why?
- What should be the concern of good town government? Why?
- How can the rights of the people be best protected?
- Should the rules/law be fair to everyone? Why?
- Should rules apply to everyone? Why?

Home on the Beach

TOWN COMMITTEES AND THEIR VIEWPOINTS

Real Estate Development Committee — Viewpoint A

There is a shortage of houses in this town. With cars and good highways more people want to live by the ocean all year-round and commute to work in the cities 75 miles away. To meet this housing need we must be able to build on much of our now empty beach property. Houses on this property will bring new taxes for our town. More tax money will mean that we will be able to build a community center and improve our storm damaged roads.

Right now houses here are very expensive, but if we can build along the beachfront more houses will be available. This will bring the cost of housing down and people will be able to afford living in a beach community.

The new ruling has drastically reduced the amount of property that can be built upon. There is little left for new development.

Beachfront Property Owners Committee — Viewpoint B

Many of us bought beachfront property but have not yet built our homes. Now we are told that we can't build on our own land. Such a ruling is the same as taking away our land. What good is it to us if we can't live on it? We paid large sums of money for this prime property; some of us paid as much as $20,000 for a small beachfront lot.

How can we be repaid for our loss? Is the town willing to buy back the property to keep the beachfront area free of buildings? Our town treasury certainly doesn't have that type of money!

We bought our land with the intention of building on it. Now this right to build is being taken away from us.

Recreation Committee — Viewpoint C

Beaches are a valuable natural resource that people can enjoy in many ways. As our cities become congested with people, traffic and smog, the shore offers a good place for relaxing and playing. But it is also a limited resource — there are only so many good sandy beaches for swimming and sun-bathing.

We must protect our beaches for ourselves as well as for people living in the future. If we continue to line our beachfront with houses, high-rise hotels and shops, it will make it more and more difficult for people to get onto the beach.

More people living in the area will also mean more roads, garbage, air pollution and sewer lines. Much waste and road dirt will be carried out to the waters. Beaches can become polluted and unsafe for swimming and fishing.

Open beach areas are necessary so that many can take advantage of what the beach has to offer. It is not right to limit it to a few?

Beach Management Committee — Viewpoint D

The best protection we have for preserving our beaches and property is to leave our beachfront area in its natural state. When we build right up to the shoreline we lose much of the dunes. They serve as the first line of defense against the storm forces of wind and wave. Beachfront buildings have little protection. Yet, when damages occur, money from the disaster fund is used to help these property owners recover. In a sense, we are supporting the luxury enjoyed by beach property owners through our taxes.

Buildings on the beach disturb the dunes which help to protect property farther inland. There is also greater sand loss when dune grass is no longer there to capture and hold the sand in place. Dunes also help to replace sand washed away from the beach.

Building on the beachfront often quickens the process of beach erosion. In order to keep our beaches and protect homeowners, we must limit beachfront development. Giving people the right to build on beaches takes away others' right to the natural resource of the beach and its many benefits.

Home on the Beach

WORKSHEET: IDENTIFYING THE MAIN ARGUMENTS

1. What is (are) the main issue(s) in the case?

   a. _____

   b. _____

   c. _____

2. a) In a summary form list below each person's main arguments.

   b) From the viewpoint of your committee, how important is each argument. Indicate the degree of importance using a scale of numbers from 1 to 4.

   4 = most important
   3 = very important
   2 = somewhat important
   1 = not important

Mr. Knowles' Arguments	Importance	Mr. Carter's Arguments	Importance

Activity 13: "Oystertown and Oil" — A Dilemma Discussion

Materials:

- Student Handout 15: *Oystertown and Oil*

Overview:

The development of offshore oil fields continues to be a current topic of intense debate because in conflict are differing needs and desires. We depend on oil for "basic" necessities, yet recognize environmental changes resulting from oil production activities as well as long-term environmental and economic repercussions from major catastrophes such as oil spills. The problem becomes one of "trade-off" — what are we willing to sacrifice to meet our energy needs? What are acceptable risks? What ways can risks be minimized? In this dilemma students will consider the issues of economic benefits, environmental impacts and responsible decision making by elected public officials.

Dilemma Discussion:

Follow the basic procedure for conducting dilemma discussion as suggested in this Teacher's Guide, pp. 11-15.

Comments and Suggestions:

While this module has not directly addressed energy issues it is useful to help students become aware of our energy needs and consumption patterns. Prior to the dilemma discussion, you may wish to assign students to research one or more of the following questions. Students may research different questions and share their findings with the other class members.

- How much oil does the U.S. use daily? How much does the average person use? Where does it come from? What portion of it is imported?
- What are some of the ways in which we use oil? List some petroleum products. Are there other good substitutes for these oil-based products?
- What are the different ways that oil is transported? What dangers are associated with the different modes of transportation?
- What are some of the consequences of offshore oil spills? How can oil spills be cleaned up? Describe the effects of a recent oil spill.
- How might we be affected if we were unable to obtain sufficient supplies of oil? What adjustment would we have to make?
- What states are currently producing oil offshore? Have there been any major problems?

Dilemma 6 — OYSTERTOWN AND OIL

Bill Harvey, mayor of Oystertown, was overjoyed when the Alco Oil Company selected the town's 200-acre marshland to build a pumping station and oil tank storage area. This station would receive the oil pumped in from the newly discovered oil field offshore. Such a project would bring the town back to life again.

Oystertown was once a prosperous shellfishing community. Then in the early 1960's the nearby bay was dredged to widen the waterway for larger boats. Shortly after the dredging operation, an unexplained disease infected the shellfish beds in the bay. The shellfish slowly disappeared. Activity in Oystertown came to a near standstill. Fishermen no longer brought in their large catches. The fish processing plant closed. Stores suffered a serious loss of business.

The pumping station would mean jobs for the people who have been long out of work. New tax money from the station will pay for badly needed repairs around town. There will be more business for the local stores. Without this new development the town might sink deeper into poverty. Its residents might need to move away to find jobs elsewhere.

The oil company presented its plan to the townspeople, and most were as happy as Mr. Harvey over this great opportunity. No one questioned whether filling in the marshes would affect the surrounding area or whether the plant would create a pollution problem. Everyone seemed most eager to approve the plan.

Two weeks before the vote on the plan, Mr. Harvey carefully reread the special study report on the possible effects that could occur when oil is piped in from the ocean wells. It predicted that in the process of recovering all the underwater oil, four major (over one million gallons) oil spills and 3,000 small (100 gallons) spills would take place. There was greater chance that Oystertown would suffer because the pipeline would run directly into the area. The spilled oil would damage its beaches as well as kill many water fowl, fish and plant life.

Mr. Harvey knew that if the people were warned about these possibilities they would be less in favor of the plan. He felt that if the town were to survive it had to bring in the new industry. He decided to keep the information from the report to himself and therefore insure the approval of the plan.

Should Mr. Harvey keep the information to himself? Why or why not?

DISCUSSION QUESTIONS

- Is it right for Mr. Harvey not to warn the people about oil spill dangers? Why or why not?
- What are the duties of a good official?
- Is Mr. Harvey doing what is best for his town by not telling? Why or why not?
- If Mr. Harvey feels that the new project will benefit his town, is that a good reason for not telling? Why or why not?
- Should people have the right to know all the facts before making a decision? Why or why not?
- Is not telling the same as lying? Why or why not? Is it ever right to lie? Why or why not?
- If you lived in Oystertown and discovered that Mr. Harvey kept information from you, how might you feel? Why?
- Since the townspeople seemed to favor the project, would it make any difference whether or not Mr. Harvey pointed out the results of the special study? Why?
- Is it important that the public trust their elected officials? Why? What does *trust* mean?

Activity 14: "Oil and Coastal Changes" — A Senario Writing Exercise

Materials:

- Student Handout 16: *Bass Town Scenario Topics*

Overview:

The development of offshore oil will have a variety of impacts on environmental, social, economic and political systems. While the impacts are complex and intricate, an examination of potential changes and effects can develop an awareness of some of the concerns and issues that oil exploration has generated.

This scenario writing exercise is the format employed to engage students to think about the impact of oil development on a hypothetical coastal community. A list of suggested topics is given, and students will select one to expand into a story form, putting themselves in the role of the person involved. Ideas and concepts acquired from this module will hopefully be incorporated into their scenarios.

Procedure:

Have the students select one of the situations they wish to write about from the list of suggested topics. The scenario writing may be accomplished individually or as a small group.

Scenario Writing

Scenario writing is frequently used as a tool for forecasters to explain and explore a future forecast. By developing a story around a series of possible events or desired goal, one can examine the complex interaction of factors and variables of that situation. Thus a scenario allows the writer a flexible way to consider possible changes, consequences and interrelationships from a broader perspective. A scenario is often used as a planning guide to detail those steps necessary to achieve a particular goal or to investigate effects of particular decisions. Since different decisions give rise to different futures, a scenario of this type would also describe the implications of a decision.

The scenarios which the students will write for this activity will be of a simpler, more abbreviated form. Basically, they will consider an impact of oil development from the perspective of the character they have selected. In some cases they will make a decision for that character and discuss the types of changes that might come about. In other cases they will consider how the role character might respond to a given change and the types of options that are available. In all cases the scenario is a description of a possible future — what could be.

Students will have to stretch their imagination and speculate about certain kinds of changes and try to identify the kinds of effects those changes will bring. They should begin to realize that a single change brings about other changes. As they relate one event with another, a larger picture emerges and the scenario unfolds. The "big" picture as presented in the scenario provides a mechanism for evaluating what is desirable or undesirable in a possible future situation.

Science fiction is one form of scenario writing. Since most students are familiar with science fiction in books and films, examples from this format may prove useful in assisting students in the development of their own scenarios.

Some helpful questions to guide the student include:

In the situation outlined, what changes do you predict will occur?

How might the person you represent feel about the changes?

In what ways can you respond or adjust to the change? What are all the possibilities you might consider?

How do some of the known facts or preferences affect the choice or decision you might make?

What concerns must be considered in a good solution?

Are your arguments or reasons well presented?

How well does the story hold together? Does one idea relate to another?

Is it interesting to the reader?

When students work in small groups, the possibility of exploring a number of different ideas is increased. One useful technique for getting started in a small group is *Brainstorming*.

The Brainstorming Technique

The purpose of this technique is to try to obtain as many ideas as possible. Present to the group the basic theme to be developed. Let each person in turn contribute an idea and continue going around the group until all possible ideas seem to be exhausted. One person's idea often leads to other ideas. Or ideas may result from combining several ideas. The important rule for brainstorming is to reserve judgment. No one critically comments on another person's idea. Each and every idea is treated equally, no matter how farfetched it may seem. Have one person record the ideas, and at the end of the session the list will be read. The group can then decide which ideas are more interesting, practical or feasible to incorporate in the scenario.

The scenario may be presented in a number of ways: a story, a poem, cartoon drawings, a dialogue or a short skit. The underlying purpose of this particular exercise is to look into a potential change and how the role character might possibly be affected or respond to that situation. Therefore, encourage the students to be imaginative, extend their ideas, and consider possible alternatives.

Comments and Suggestions:

Have the students present their scenarios in class as a culminating activity. In light of the scenarios presented, the class may wish to decide whether or not the offshore oil development activities are advantageous to the Bass Town community.

BASS TOWN SCENARIO TOPICS

Introduction:

You are residents of Bass Town, a very small fishng village. Most of the adults are commercial fishermen who make their living fishing the shallow waters off the coast. Everyone knows one another because the families have lived here for generations.

Oil drilling platforms will be constructed 50 miles offshore and new workers will be coming to live in the area. It is predicted that 200 new families will come to town, and because the construction work is temporary, many will be living in trailer homes.

- You are the principal of the local grammer school. The school is old but has served the community well. However, classrooms are currently crowded with over 30 pupils in each room. With the new people coming into town you will have 150 more students. How might you deal with so many more students? New classes? A new school? Who will pay for this? What might you do with extra classrooms when the people move away?
- You own a large parcel of land on the outskirts of town. You think it will be ideal for a trailer park for the new workers and their families. Since this trailer park will serve as a home for the newcomers for several years, what might you include in this park to make their stay more comfotable? How might it be arranged so that the local people don't object to its appearance? What might you do with the trailer park after the people leave town?
- You are the local highway and road engineer and conducted a recent survey of the road conditions of the area. You find that the roads have to be widened and repaved to handle the heavy trucks that will be bringing in equipment and supplies for the oil rigs. Otherwise, with the increased traffic the roads may be damaged beyond repair. How might you convince the local people that they will have to raise tax money for the road work? How might the townspeople benefit? Or, can you get the road repairs paid for in other ways?
- You own a boat repair yard that has served the fishermen for the past 25 years. You realize that your business will increase with all the supply boats needed to service the oil drilling operation, but you need to expand your docks and repair area. An outside company has offered to go into partnership with you because you don't have enough money to build the new additions. You have enjoyed being independent and making your own decisions but this will change with a new partner. How might you feel about this? What might you do? What changes might you think are of benefit to you?
- You own a number of summer cottages which have been rented to the same people from the city year after year. They come here because they like the calm, peaceful atmosphere of an old fishing village and the friendly people. Also, the swimming and sport fishing are excellent. You are afraid that with all the new people, the quiet village fishing will change. Also, you are worried that the increse in boating activity might bring many changes to the quality of the water as well as disturb the fishing areas. Summer visitors might not appreciate the quiet harbor filled with boats. Power boats can churn up bottom sediment clouding the water with mud as well as undesirable contaminants. How might you handle the changes? Might you no longer rent to summer visitors? Would you convert your cottages for year-round residents, possibly the new workers?
- You are a commercial fisherman, and fishing has been the only occupation you know. Your greatest fear is the possibility of oil spills. Even a small one can kill many fish and damage the fish spawning grounds when the currents bring the split oil into the shoreline area. This can affect your livelihood for months, if not years. What might you do? Would you even consider moving away? Might you consider doing something else?
- You own a large fishing boat and must hire a crew to help you run the boat. You learn that the platform construction company is looking for crews to operate the supply boats. Moreover, it is offering higher salaries than you pay and will also provide workers with medical insurance. You realize that you can't offer higher salaries without charging more for the fish. If your fish cost much more than that of others, you will have a hard time selling it. How might you convince your crew to stay with you. What benefits might you provide? Will you continue fishing?
- You are an oysterman and have leased for a number of years an oysterbed in the bay to harvest the shellfish. You discover that a channel is to be dredged in the bay so that the supply boats with their deeper drafts can enter the harbor. In dredging the channel, mud and silt will be stirred up and later settle on the oysterbeds, smothering the oysters. Water circulation patterns can change and alter the growth of the animals. How might you respond to this? What can you do about this effect on your livelihood?
- You work at a local restaurant and live in a small rented apartment. Your lease will soon be up, and you know that your rent will be increased with a new lease. With new people coming into town there will be a shortage of housing since all will not bring in trailers. The landlords know that they can charge higher rents because the skilled construction workers are paid high wages. Although your rent is about the lowest in town, you can barely afford to pay it. How might you find another place to live in town where there are few apartments for rent? Would you have to think about moving elsewhere?

APPENDICES

APPENDIX A

Who Owns Our Beaches?

by Anthony Wolff

LAST YEAR, A WOMAN NAMED PHYLLIS WAYNE paid $125,000 for a 40-foot-wide lot with a 180-degree ocean view in Malibu, the beach colony of Hollywood, just up the Pacific Coast Highway from Los Angeles. Wayne's routine application for a building permit was granted with one proviso: that she dedicate a six-foot strip along her property line as a public access from the road to the ocean. No access, no permit. Reluctantly, she agreed.

The reaction from her new neighbors was immediate. "The calls were menacing, not threatening," she recalled later, "designed to make me feel uncomfortable and to understand, 'None of us will look kindly on you.'" By providing public access to the beach, the neighbors warned, she was inviting vandalism, trespass, littering, and other crimes and misdemeanors. Nevertheless, the law-abiding Wayne declined to fight the access regulation or to take her neighbors' suggestion that she sell out and find "more suitable property somewhere else." After friendly persuasion had failed, the neighbors hauled Wayne into court, where the matter is still being fought out.

Taken by itself, the reaction of Wayne's neighbors is disproportionate to its cause; the whole Malibu episode seems slightly comical. But Malibu is only one skirmish in a much bigger battle. Up and down the long and lovely coast of California, the people are pressing for access to the beaches. And in every coastal state, cherished common-law and constitutional private-property rights are challenged by the claim of the public to an equitable share in the seashore.

The problem is not that we don't have enough beach to go around. According to one government survey, the tidal shoreline of the United States excluding Alaska and Hawaii measures almost 60,000 miles, of which 4,350 miles are sandy beach. If the average dry-sand area of the beach is 50 feet wide and if each person is allowed a 10-by-10-foot territory, there is enough room for 11.5 million people at a time.

Most of the beach, however, is strictly off limits to most of us, fenced and posted and patrolled by humorless gendarmes to keep the public out. According to immemorial custom, the ocean below the mean high-water line in most states is the public domain, common property held in trust for us by the state. The beach itself, however, is either private property or so restricted that it might as well be. A government study in 1962 found that less than 2 percent of the country's total shoreline and 5.5 percent of the shoreline suitable for recreation were publicly owned. Massachusetts, for example, has 1,200 miles of coastline, of which some 175 miles are open to the public. Only 151 miles of Florida's 1,358-mile beach permit public access. A Ralph Nader-sponsored study recently reported, "Of the 1,072 miles of California coast... only 290 are beaches suitable for swimming. Only 90 of these miles are publicly owned, and most of this coastline (53 miles) is held in military bases." Moreover, the more recent rate of public beach acquisition has not been nearly enough to keep up with the growth in population, leisure, and mobility, much less to make up for past deficits. In effect, the public beach has been steadily shrinking.

In earlier, easier times, it didn't matter so much who owned the beaches. Along many relatively undeveloped shorelines, landowners either permitted or passively tolerated innocent trespass. No longer. As land values have soared—and property taxes have kept pace—unguarded stretches of private beach have been subdivided into high-priced-house lots. Private owners—both individual citizens and coastal communities—have become increasingly jealous of their precious property rights and diligent in denying public access to the sand.

This past winter, for example, the recreation commissioners in liberal, tony Westport, Connecticut, voted to charge a $25-a-day parking fee to discourage nonresidents from using the town's Compo Beach. Westport residents can buy a season sticker for $10. Other towns in the Northeast refuse admittance to outsiders at any price and issue dog tags or laminated-plastic ID cards with color photographs to separate taxpayers from freeloaders.

From Greenwich, Connecticut, comes the sad story of a yachtsman who anchored off the private beach there one balmy night and blithely rowed ashore for a dinner engagement. Dinner done, he was about to cross the sand to regain his dinghy when he was intercepted by the local constabulary, who ever so politely suggested that he swim back to his mooring from the nearest public beach. And in the so very particular New Jersey resort town of Deal, the guests at an oceanfront house were arrested and fined $200—the sentence mercifully suspended—for using the town beach, reserved for taxpayers.

While the defenders of private beaches have become more resourceful and aggressive, so have the open-beach insurgents. The quixotic beach crasher, subverting the laws of property in the name of humanity, is now supported by advocates in the courts and the legislatures of every coastal jurisdiction, arguing that the beaches ought to be open to all as a matter of constitutional law and reasonable public policy.

BEGINNING BETTER THAN 15 YEARS AGO, a series of controversial court decisions in several states has already had the effect of legitimatizing trespass on beaches in certain common situations. In 1964, a Texas court ruled against a property owner who had built a fence across his private beach to the waterline, blocking the public's "free and unrestricted ingress and egress" to the Gulf of Mexico. Aged residents of the area testified that the beach had been used as a public right-of-way for generations without interference from the landowner. The court decided that the proprietor's long acquiescence constituted unwritten permission—"implied dedication," in legal jargon—that he could not revoke. The public had acquired a "prescriptive easement" to trespass forever.

Facing the same issue in 1970, a California court decided that five years of unopposed trespass was enough to establish implied dedication. Two years later, a court in Florida

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agreed that 20 years of public use of a private beach—"open, notorious, visible... and without material challenge or interference"—was sufficient to make the beach public.

Such ingenious assaults on the sanctity of private property have had little success in the Northeast, however, where strict notions of the difference between mine and thine came over on the Mayflower. Instead, open-beach advocates have zeroed in on the special case of town-owned "public" beaches that exclude or discriminate against nonresidents. In a landmark 1972 decision in New York, the Supreme Court of Nassau County, on Long Island, ruled that the town of Long Beach had created an irrevocable "public trust" by allowing the general public to use its beach since 1935 and could not switch to a residents-only policy. Earlier in 1972, the New Jersey Supreme Court went even further in the same direction in the case of *Neptune City v. Avon by the Sea*. The public trust doctrine, said the court, not only meant that a town had to open its private beaches to the out of town public but also meant that the town could not milk nonresidents for higher admission fees than it charged the locals.

Such victories have encouraged the open-beach cause, but they have not won the war. The process of litigating the same questions case by case in state after state has proved to be too expensive and too enervating to sustain. Despite the decisions of courts in New York and New Jersey, for example, towns in Connecticut and Rhode Island and elsewhere have continued to exclude nonresidents or to charge them exorbitant fees. The courts have confined themselves to the specific cases before them, avoiding the underlying questions of the legal status of beaches in general and the civil rights of people to use them.

An important exception was the Oregon Supreme Court, which in 1969 settled a narrow question of beach access by applying broadly the ancient English common-law doctrine of "customary rights." "According to a custom running back in time as long as this land has been inhabited," said the court, all of the state's beaches have been freely used by the public since aboriginal times. (In Blackstone's phrase, "The memory of man runneth not to the contrary.") Therefore, concluded the court, not only the beach in question but the entire coastline of the state is open to everybody, forever.

Most state legislatures have been even more cautious than the courts. In Massachusetts, a few years ago, a state senator from South Boston had the nerve to introduce legislation providing that "the public shall have an on-foot right-of-passage along the coastline of the commonwealth below the vegetation line." No right to sit down or to swim or to picnic or even to pause, the senator assured his colleagues, just to walk. Even this was too much for Massachusetts, and the bill died aborning.

The laggardliness of state legislatures in dealing with public beach access has allowed the United States Congress, hardly noted for alacrity in responding to controversial questions, to seize the lead. In 1976, Congress amended the Coastal Zone Management Act of 1972 to include public access to beaches as a matter of special concern in the management of the nation's coastal areas. As amended, the act specifically encourages participating coastal states to include in their planning "the protection of, and access to, public beaches." And as an inducement, the law also provides for federal grants to the states for up to 50 percent of the cost of acquiring land for access to public beaches. In most states, all the sand below the high-water line is public beach, and most of that is high and dry most of the time, especially in summer, when tides are low. With adequate public access therefore, vast areas of "private" beach would be effectively public.

As in so many other social changes, California has been way ahead of the other states in expanding public beach access and may serve as a model for the rest of the country. California's state constitution already mandates maximum public access to its coastline, and a long-standing subdivision law requires public access through developments on the shore.

Both law and constitution were regularly flouted, however, until 1972, when the citizens revolted. Taking advantage of a California law that permits the public to legislate directly by referendum—the same law that fostered the property-tax revolt last month—the voters passed Proposition 20, a law to regulate development of the coast and to ensure public access. Under the California Coastal Act, California now has two agencies zealously working to make sure that people can get to the beach.

The California Coastal Commission, operating through six regional commissions and in collaboration with other state and local agencies, has the overall responsibility for planning and regulating all new development in a broad coastal strip running from the top of the state to the Mexican border. Before it issues a building permit for any new development—even a single-family house—on the California coast, the commission will require that existing public access be protected. Where there is no public access to begin with, the commission will require the developer to provide one through his property from the nearest public road to the water's edge. The California Coastal Conservancy, a complementary state agency, has the power to acquire and hold land providing access to the coast by dedication from a private owner, by purchase, or by condemnation, if necessary.

As Ms. Wayne is finding out in Malibu, however, California beach owners are digging in to keep the public from spoiling their view of the ocean. It promises to be a long fight. All the beaches won't be open this summer—maybe next.

Anthony Wolff is a New York free-lancer who frequents the beaches in Truro, Massachusetts. ●

Minister Fights Beach Tag Fees[1]

CAPE MAY, July 2 (UPI) — Dr. Carl McIntire, the fundamentalist preacher who gained national publicity for his Vietnam War "victory marches," plans a march tomorrow to try to stop Cape May from collecting fees on his private beaches.

"We're going to get our beaches back," Dr. McIntyre said today. "They have no right under the sun to take away my property."

Cape May a quiet resort town that has carefully cultivated its Victorian image, has argued that because Dr. McIntire's beaches are open to the public, its users must buy municipal beach tags. Other Cape May beach property owners have agreed to allow the city to require tags on their beaches.

Tax Battle Involved

"McIntire is the only one who gives us trouble," a town official said today.

The dispute, which has been the subject of protracted negotiations between Dr. McIntire and the city, stems from his long-standing tax battle with Cape May.

The minister, who owns several properties in Cape May, has argued that his properties are tax-exempt because they are used for religious purposes.

Dr. McIntire said he was paying taxes on the Windsor and Congress Hall properties and added that he would not tolerate beach fees.

Free Beaches Supported

"I think the beaches should be free to everybody," he said, "It goes back to our policy of private ownership."

The city says the fees are needed to pay lifeguards and maintain the beaches; Dr. McIntire says he will hire his own lifeguards to patrol the Windsor and Congress Hall beaches.

But the City Manager, Robert Cabana, said that the beaches were unsafe without city-certified lifeguards, and that none of Dr. McIntire's guards had applied for certification.

Dr. McIntire, who also gained national attention over the licensing of his fundamentalist radio station, said that up to 100 members of his Cape May Bible Conference would march onto the beaches attached to his Windsor and Congress Hall Hotels at 11 A.M. tomorrow "and tell the tax collectors to get off our beaches — if they don't we'll ask the police to arrest them." His allusion was to those selling beach tags.

Police Discretion Proposed

"That's wonderful," a police officer said today, "I guess we'll have to use police discretion. It makes you wonder which way the world is turning."

Dr. McIntire said the users of his beaches had refused to pay the tag fees last years" and the city backed off."

He said that a member of his congregation had received a summons last week for refusing to buy a tag and that his conference would try to have the $20 summons thrown out at a municipal court hearing at 10 A.M. Wednesday.

[1]Reprinted by permission from United Press International. *The New York Times*, Monday, July 3, 1978.

APPENDIX C

The New Jersey Wetlands Act Of 1970

I. Background.

The following is a summary of Chapter 272, Laws of 1970, which concerns the protection of natural resources in coastal wetlands. It also requires that permits be obtained from the commissioner of Environmental Protection prior to dredging, removing, filling, or otherwise altering or polluting the coastal wetlands.

The N.J. Legislature declared that one of the most vital and productive areas of our natural world is the "estuarine zone," that area between the sea and the land. This area protects the land from the force of the sea, moderates our weather, provides a home for water fowl and for ⅔ of all our fish and shellfish, and assists in absorbing sewage discharged by the rivers. In order to promote the public safety, health, and welfare; to protect public and private property; and to protect wildlife, marine fisheries, and the natural environment, it is necessary to preserve the ecological balance of this area — to prevent its further deterioration and destruction by regulating and dredging, filling, removing, or other altering or polluting of the area.

N.J.'s estuarine zone is unique. It is related to the sea and the land, but it is different from either. The estuarine zone is composed of bays, harbors, lagoons, channels, inlets, barrier beaches, sounds, estuaries, wetlands (tidal marsh), submerged lands (riparian), tidal portions of many freshwater streams and tributaries, and coastal and intertidal areas. Complex physical, chemical, and biological forces act and interact within this zone and create an exceptional but delicately balanced environment.

N.J. wetlands are extremely fertile and productive, yielding up to 5 to 6 tons of dry organic matter per acre per year. In comparison, the world average wheat production is only 0.5 tons per acre. The sustained high fertility of wetlands depends on many natural factors.

Plant life occurs in all wetlands as marsh grasses and algae. These plants grow and die. Decay transforms their tissues into minute fragments of food and vitamin-rich detritus. This detritus is suspended in the water and forms a nutritious "soup" that is carried into tidal creeks, bays, and offshore waters. Nearly all species of sport and commercial fish, shellfish, and other marine creatures in the estuarine zone are dependent on this "soup" for food, directly or indirectly.

Marsh detritus is transported back and forth by tidal action into sounds and bays and, eventually, to nearshore waters. This "outwelling" of nutrients and materials into the sea is similar in mechanism and magnitude to oceanic upwellings that support valuable fisheries in various parts of the world. Outwelling provides nutritional materials that may support marine life at lo $_{5}$ distances from our coast. Thus, there is a continuum from the wetlands to the open seas. Some fish that never enter or utilize wetlands are dependent on the estuarine zone for the continuous enrichment of their oceanic habitat.

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Many aquatic animals feed on wetland plants, detritus washed from wetlands, and the algae that float in the water and coat marsh and channel surfaces. Other animals, including man, prey on animals that have eaten these foods; all, directly or indirectly derive their energy from wetland (estuarine zone) flora.

Wetlands vegetation responds sharply to interactions of salinity (soil and water), moisture, elevation, and tides. Elevation plays a major role in determining wetland plant community composition, because elevation determines the extent to which each community will be inundated by high tides. N.J.'s wetlands vary in plant species composition, and that variation depends, primarily, on the amount of salt in tidal waters.

The wetlands, physically, act as a buffer between the sea and land; they help protect man. They absorb a portion of wind and storm wave energies, and they provide large storage areas for flood and storm waters. These functions, in turn, reduce mainland erosion rates and lessen social and economic hardships caused by upland flooding and high winds.

Wetlands are dynamic and everchanging. Storms and winds may rip their turf and, for a time, alter natural drainage and contour; but the marsh is resilient — it survives and adjusts to new combinations of physical forces.

Filling wetlands can reduce their capacity to store storm or flood waters. Nonstorable storm waters may then infringe on neighboring marshes or uplands and cause extensive damage which otherwise may not occur.

Developments in wetlands are particularly vulnerable to wave and water damage because of their proximity to the sea. Those who live in structures built on wetlands are gambling. Major floods will continue to occur, and subsequent property damage costs will be proportional to the severity of the flooding. No one can guarantee a tranquil and nonhazardous wetland environment.

The wetlands support wintering, migratory, and summer breeding waterfowl. The mallard and the black duck breed in the wetlands and even remain in small numbers through the winter. Waterfowl productivity could be seriously depleted if the wetlands and their vegetative cover were destroyed or seriously encroached upon by man.

Reliable sports fishing statistics for the N.J. Coast are not available. Recent estimates, however, indicate that nearly one million sportsmen fish in coastal waters each year and catch at least 10 million pounds of fish. The contribution to the State's economy by these sportsmen is substantial even though quantitative data are unavailable.

In addition to commercial and sports fishing, wetlands are used for other multipurpose activities. Those uses include fishing, boating, shell fishing, bathing, hunting, water skiing, and the harder-to-document kinds of activities such as sightseeing and scientific research. All of these uses are important to man: they enhance the quality of life, and contribute to the economic and social well-being.

II. Specifics of the Order

The original wetlands legislation called for the commissioner of environmental protection to map, inventory, and delineate the wetlands within 2 years. The mapping of the wetlands boundaries was based on land areas meeting the following 3 criteria: 1) the land is now, or was previously, under tidal influence; 2) the elevation is at, or below, +1 foot above local extreme high water (this has been most difficult to define); and 3) the land is capable of supporting some, but not necessarily all, of the 19 species of vegetation which are listed in the act.

The commissioner was required, before adopting, amending, modifying, or repealing any wetlands order, to hold a public hearing in the county affected. It was also required that the owners of each parcel of land affected be notified by mail. The county clerk was required to keep a copy of the filed wetlands map on hand.

No "regulated activity" can be conducted on the wetlands without a permit. A regulated activity includes, but is not limited to, draining, dredging, excavation, or removal of soil, mud, sand, gravel, or aggregate of any kind; depositing or dumping therein any rubbish or similar material; or discharging therein liquid wastes, either directly or otherwise. Regulated activity may also include

erection of structures, drivings of pilings, or placing of obstructions, whether or not changing the tidal ebb and flow.

Two types of permits are issued to control regulated activities on the wetlands — type A and type B.

Type A permits have an abbreviated procedure and are required for the cultivation and harvesting of naturally occuring agricultural or horticultural products (but not continuing salt hay production); the excavation of a small boat mooring slip; the maintenance or repair of bridges, roads, highways, railroad beds, or the facilities of any utility or municipality (except in emergencies); and the construction of catwalks, piers, docks, landings, footbridges, etc.

A type A permit is issued by the commissioner if: 1) the type A application is complete as required by the Wetlands Order; 2) it requires water access or is water oriented as a central purpose of the basic function of the activity; 3) it has no prudent or feasible alternative on a nonwetland site; 4) it will result in minimal feasible alteration or impairment of natural tidal circulation, natural contour, or natural vegetation of the wetlands.

Type B permits are required for: 1) the installation of utilities; 2) excavation for boat channels and mooring basins; 3) the construction of impoundments or sea walls; 4) the diversion or appropriative use of water; 5) the use of pesticides except those applied directly to the skin or clothing of an individual for the purpose of repelling insects; 6) driving or causing to pass over or upon wetlands any mechanical conveyance which may alter or impair the natural contour of the wetlands or the natural vegetation; 7) the construction of any structure, filling, or excavation except as otherwise provided in this Order.

In addition to other detailed information, the type A permit requires an Environmental Impact Statement. The statement is required to analyze all possible direct and indirect effects of the proposed activity on the site itself as well as on adjacent and noncontiguous areas with particular reference to the effect of the project on the public safety, health, and welfare, the protection of public and private property, the public trust in submerged lands and wildlife, the protection, preservation, and enhancement of the natural environment, and the preservation of the ecological balance of wetlands. It relates the ecological and physical characteristics of the proposed activity site to the local and regional functioning or microscopic marine life, vegetation, birds, mammals, tidal circulation, hydrology, meteorology, geology, soils, land use, recreation, and history.

The following activities are prohibited in the wetlands: 1) placing, depositing, or dumping any solid waste, garbage, refuse, trash, rubbish, or debris; 2) dumping or discharging treated or untreated domestic sewage or industrial wastes, either solid or liquid; 3) applying any pesticide on areas containing significant stands of high vigor Spartina alterniflora (Saltmarsh cordgrass), Zizania aquatica (Wildrice), Typha sp. (Cattail), and Scripus americanus (Common threesquare) as shown, generally, on wetlands maps; 4) storage or disposal of pesticides; 5) applying persistent pesticides.

III. The Law in Action

As of March 12, 1976, over 66 permit decisions have been made by the Commissioner. The statistical breakdown is as follows: approved permits, Type A - 31, Type B - 32; denied permits, Type A - none, Type B - 3. Of those denied, one was a spoils disposal site, one a roadway where suitable alternatives were available, and the third was a private roadway. Cancelled applications, Type A - 10, Type B - 28; among some of the reasons for cancellation were: 1) wrong permit application; 2) submitted incomplete; 3) area involved did not affect the wetlands, and 4) previous riparian application had been denied.

Some idea of the effectiveness of the Act in preventing the loss of wetlands in the State can be gained by comparing acreage taken figures. Prior to the Wetlands Order (1953-1973), the State was losing an average of 1,900 acres a year. From 1973 to the present time there is a record of only 243 acres taken.

For further information on wetlands, contact Thomas F. Hampton, Wetlands Section Supervisor, N.J. Dept. of Environmental Protection, Division of Marine Services, P.O. Box 1889, Trenton, N.J. 08625, Telephone (609) 282-8202 or -8203.

IV. References.

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Sincerely,

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Supplementary Teacher Materials

Information of Coastal Environments and Wetlands of New Jersey may be obtained from:

New Jersey Dept. of Environmental Protection
Office of Coastal Zone Management
P.O. Box 1889
Trenton, New Jersey 08625

New Jersey Sea Grant Marine Advisory Service
Cook College, Rutgers - The State University
Dept. of Environmental Resources
New Brunswick, New Jersey 08903

Federal Sources of Information:

National Oceanic Atmospheric Association
Office of Coastal Zone Management
3300 Whitehaven Street, N.W.
Washington, D.C. 20235

Office of Coastal Zone Management/NOAA
3300 Whitehaven Street, N.W.
Washington, D.C. 20235
(clearinghouse for specialized coastal zone technical information)

U.S. Fish and Wildlife Service
Washington, D.C. 20240
(for information on waterfowl, game fish and endangered species)

National Marine Fisheries Service/NOAA
Page Building 2
33 Whitehaven Street, N.W.
Washington, D.C. 20235
(for information on commercial and sport fisheries)

Office of Sea Grant/NOAA
330 Whitehaven, N.W.
Washington, D.C. 20235
(an agency which supports programs of marine research, education and advisory service)

Films: (free of charge)

Motion Picture Service
NOAA
Department of Commerce
12231 Wilkins Avenue
Rockville, Maryland 20852
— *Estuarine Heritage* (28 min.)
— *Estuary* (28 min.)
— *It's Your Coast* (28 min.)
— *The great American Fish Story* (5 parts/28 min. each)
— *Watermen of Chesapeake* (28 min.)

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Office of Coastal Zone Management
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